

UNITED STATES BANKRUPTCY COURT  
FOR THE WESTERN DISTRICT OF NORTH CAROLINA  
CHARLOTTE DIVISION

IN RE: )  
 )  
GARLOCK SEALING TECHNOLOGIES )  
LLC, et al, ) No. 10-BK-31607  
 )  
Debtors. ) VOLUME II-A  
 ) MORNING SESSION

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TRANSCRIPT OF ESTIMATION TRIAL  
BEFORE THE HONORABLE GEORGE R. HODGES  
UNITED STATES BANKRUPTCY JUDGE  
JULY 23, 2013

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1                                   P R O C E E D I N G S

2   JULY 23, 2013, COURT CALLED TO ORDER 8:30 A.M.:

3   MORNING SESSION:

4                   THE COURT: Morning have a seat. We have the motion  
5 about confidentiality this morning.

6                   It occurred to me reading your papers and such that  
7 the difficult problems come with this issue if there's a  
8 public interest, and I notice yesterday there didn't seem to  
9 be a whole lot of public interest, and I'm wondering if we  
10 couldn't proceed kind of in the way -- with the trial, in the  
11 way we did with the opening yesterday. Would that satisfy you  
12 all's ends and just close the courtroom to anybody that's not  
13 issued -- not signed the confidentiality agreement?

14                  MR. CASSADA: Your Honor, obviously this is our  
15 motion to de-designate. We have an interest in having a trial  
16 being open to the public. We realize that the rights that we  
17 have asserted before the court are really the public's rights  
18 to access.

19                  We believe that before the court orders that a  
20 hearing be closed, or that special provisions be made to  
21 protect information, that the burden is on the party seeking  
22 protection to prove that it's the kind of information that  
23 courts recognize, and that the information would render the  
24 kind of injury that courts typically would rule would be  
25 the -- would be protectable.

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1           And we don't -- so we really think that the burden  
2   is on the law firms and the committee to explain exactly what  
3   it is that's confidential and why it's confidential.

4           I will point out that the beginning of the *Bondex*  
5   case, that's exactly what Judge Fitzgerald said. She  
6   complained that the parties were just taking this blanket  
7   position that things were confidential and they were filing  
8   things under seal, and she said that's not the way we do it.  
9   You have to tell me specifically what is confidential and why  
10   it's confidential, and then let me make a decision at the time  
11   whether we should see it.

12           So obviously that's why we filed the motion. That's  
13   the way we would like to proceed.

14           However, we'll certainly defer to the court -- the  
15   court's view of the best way to proceed on this. We would  
16   want to be sure that whatever the court does, it doesn't  
17   interfere with our ability to efficiently conduct the trial  
18   and put our case on.

19           THE COURT: Mr. Wehner.

20           MR. WEHNER: Your Honor, to answer your question, I  
21   think we would be happy to proceed along the lines that we did  
22   yesterday.

23           What we did, we circulated a proposed order on a  
24   couple of occasions over the weekend to the debtors that --  
25   two page order, it's very short, that takes that kind of

1 approach to dealing with confidentiality at the hearing, that  
2 is, closing the courtroom for those limited times when  
3 somebody has to talk about confidential information, and  
4 keeping things that are submitted to you in paper form, to  
5 keeping them sealed or covered by the confidentiality order in  
6 your hands.

7 Like I said, we've got a short order that we've  
8 given the debtors a couple times now. We think that way of  
9 dealing with it, that way we can work with the issues that  
10 have come up.

11 We've got seven confidentiality orders in this case,  
12 covering a wide variety of material, with a lot of people who  
13 have interests in that material, a lot of people who aren't  
14 here, a lot of people who aren't noticed by there motion, so  
15 we have to tread carefully. But we think the approach that we  
16 sketched out in this short order which is very much in line  
17 with what we did yesterday will work.

18 Do you want to hear the motion?

19 MR. CASSADA: May I ask a question?

20 THE COURT: Yes.

21 MR. CASSADA: That is -- well, first of all just to  
22 respond to the notice issue.

23 We have -- in our motion we have focused on the  
24 specific issue of the deposition testimony and documents of  
25 the law firms, and we've given the law firms notice. I don't

1 believe there is any notice issue, but just to get  
2 clarification on the court's order. When the court clears the  
3 courtroom, is there going to be an order that actually holds  
4 the testimony or the evidence presented during that time  
5 period is in fact under seal, and it should not be shared with  
6 members of the public?

7 THE COURT: I think that's probably how we ought to  
8 proceed with the specific order, and do the best we can to see  
9 that we comply with that.

10 It's a very -- I mean, it's a -- seems to me to be  
11 fairly important to you all, but it's a pretty narrow, limited  
12 part of the whole bundle of the hearing that we have here.  
13 Seems to me we would handle it in that way to be a minimal  
14 kind of intrusion on -- to the public affair of the trial.

15 It's not -- I think it seemed from the opening  
16 yesterday, none of it seemed particularly sexy or something  
17 that anybody would be of any particular interest in, other  
18 than the parties.

19 MR. CASSADA: Yes.

20 THE COURT: So I don't think we're really denying  
21 the public any great -- any earth shattering kind of  
22 information by doing this.

23 MR. CASSADA: There is -- we believe there is  
24 substantial public interest in the type of information you  
25 heard yesterday, and the -- even the law firms we think

1 recognize that, and even the committee seems to. Because we  
2 have -- we've seen at least one of the law firms has given  
3 public testimony about the testimony and the discovery made in  
4 our case, mentioned our position, mentioned their client by  
5 name, and testified about the position we had taken, and why  
6 the evidence didn't support it, and that testimony is actually  
7 a matter of public record and it's before the ABA task force  
8 that's been -- that's focusing on whether to approve a  
9 bankruptcy rule that would require trust transparency.

10 THE COURT: We're here for trial, so that's how  
11 this -- that's how -- the only reason this information is  
12 gathered, and that's where I intend to limit it at this point.

13 MR. CASSADA: Certainly, yes.

14 THE COURT: I mean, I -- I mean, there's lots of  
15 considerations here, but the claims of confidentiality were  
16 broad, but also the moving party here is somebody who agreed  
17 to the confidentiality. So, you know, there's things on both  
18 sides to this --

19 MR. CASSADA: Well, Your Honor, let me address that  
20 for a minute, because that goes to an argument that we've  
21 somehow agreed to something and have occasioned a bait and  
22 switch, and we take exception to that.

23 The stipulated protective order wasn't an agreement  
24 that any particular information was confidential. In fact, it  
25 was entered into before the documents in discovery were given

1 in this case.

2           The point of the order was to agree to a procedure  
3 wherein parties would be permitted to designate in good faith,  
4 documents and information that's confidential, and save for  
5 another day any dispute about those. That's exactly what  
6 happened in this case. We entered into the stipulated  
7 protective order. We amended it before this depositions to  
8 allow third parties to make designations under the stipulated  
9 protective order. But the order is very clear. They're  
10 making these stipulations -- in this case they were  
11 designating information in advance and the stipulated  
12 protective order actually has provisions to permit a party to  
13 contest or challenge specific information that's provided.

14           So there's no basis for really concluding that  
15 entering into a stipulated protective order was an agreement  
16 that any information provided after that would be worthy of  
17 protection and shouldn't be offered in open court.

18           The language of the order is really quite clear on  
19 that, and even in paragraph 10, which preempts by its terms,  
20 the remainder of the agreement, it says that notwithstanding  
21 any other provision in this stipulated protective order, any  
22 receiving party may disclose confidential information in the  
23 manner and to extent authorized by an order entered by the  
24 court, upon a motion submitted to the court not less than five  
25 business days notice to the producing party, and after a

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1 hearing on the motion, unless the court orders that no hearing  
2 be held.

3 So that's really what the stipulated protective  
4 order was all about.

5 And we have -- we have obviously moved to be  
6 permitted to air this information in open court, exactly as  
7 the stipulated protective order provides. So if there's any  
8 reliance, it's our reliance on the procedures of the  
9 stipulated protective order.

10 I'm going to sit down, but we just think that before  
11 the court enters an order recognizing information as  
12 confidential, and denying public access, that a party whose  
13 providing the information has the burden of showing the court  
14 that that type of protection is warranted in the case, and  
15 that's a heavy burden. That simply hasn't been met or even  
16 offered in this case.

17 Obviously we will abide by any order the court  
18 procedure you suggested, seems like it would allow us to move  
19 forward in trial inefficient manner. That's our number one  
20 interest today and over the next three weeks.

21 MR. WEHNER: Your Honor, in a spirit of trying to  
22 come up with a way of moving forward, can I share with you the  
23 effort that we've shared with the other side?

24 THE COURT: All right.

25 MR. WEHNER: I said it was two pages, I guess I was

1 a little over ambitious, it's three pages. But basically the  
2 first couple paragraphs say that written material that comes  
3 into you keeps its designation. We're going to try and keep  
4 track of what's confidential and what's not confidential, and  
5 before the conclusion -- within 30 days of conclusion of  
6 estimation hearing, we'll submit to you an agreed list of what  
7 was used that was confidential so that you know.

8 And then just like we did yesterday, if in the  
9 course of an argument or testimony by a witness somebody needs  
10 to get into something that's covered by one of the  
11 confidentiality agreements, we request you to clear the  
12 courtroom of persons not entitled to access. That's about it.

13 THE COURT: Do you have any specific problems with  
14 implementing this order, Mr. Cassada?

15 MR. CASSADA: Your Honor, what we would ask is that  
16 the order have a provision in it that specifically states that  
17 after the evidence is entered and you have a chance to see  
18 what it is, that we can visit without prejudice the issue  
19 regarding whether this information really is information that  
20 should not be open to the public.

21 THE COURT: I think we can do that pursuant to  
22 paragraph six, can we not?

23 MR. WEHNER: Yes.

24 MR. CASSADA: If that's the understanding.

25 THE COURT: I believe it is. We can revisit any

1 order entered. Why don't we enter this order, if you'll  
2 upload it and I'll enter it.

3 MR. WEHNER: We'll do so today, Your Honor.

4 THE COURT: We'll proceed under that fashion, as  
5 long as it's just here, just us that are interested in it and  
6 see if that won't work.

7 I will have to ask if you all have to work out a  
8 procedure to release it when you do -- when you do get to the  
9 portion that we need to seal the courtroom, let me know. But  
10 then you need -- we may need to post somebody at the back door  
11 to keep other people from coming in during the process. Okay?

12 MR. WEHNER: Yes, sir.

13 THE COURT: All right. That's what we'll do.

14 And then I need to -- we had one bit of slippage  
15 yesterday while we were doing this, and we have the  
16 transcripts that were sent out, went to one party who was  
17 not -- who had not signed a confidentiality agreement. And  
18 we've asked them to send that back. We've got the email trail  
19 for you all that was -- something Capital. Let me give you  
20 all these, start reading. It's a typical email chain, you've  
21 got to read backwards. Somebody got it and notified us and  
22 now we have asked them to return the transcript that was sent.

23 Let me give you all a chance to read that, and I  
24 guess we'll come back at 9:30. If you've got any other ideas  
25 about what we can do about that, let me know. We just asked

1 them to send the transcript back.

2 If you want to read it right now, we can talk about  
3 it now.

4 (Pause.)

5 THE COURT: I don't know that part I guess maybe you  
6 all do, sounded like a stock broking outfit to me and they  
7 were concerned that --

8 MR. WEHNER: Don't seem particularly interested,  
9 Your Honor.

10 THE COURT: Yeah. I think they were mainly  
11 interested that they didn't get busted for insider trading.

12 Do you know them, Mr. Cassada?

13 MR. CASSADA: This is -- a company that trades in  
14 securities markets, and we do have a concern about them having  
15 selected information if this is deemed confidential.

16 THE COURT: Do you have any other solution other  
17 than asking them to send stuff back?

18 MR. CASSADA: You might -- it sounds like from  
19 reading this that they're saying that they had stopped  
20 reviewing --

21 THE COURT: Right.

22 MR. CASSADA: -- transcript. Might be the court  
23 might consider entering an order instructing them to return  
24 the transcript, destroying the copies, et cetera. I don't  
25 know if the court has the power to enter that order, but

1 giving them notice they certainly, from this email seem to be  
2 open to that.

3 THE COURT: Yeah, I think --

4 MR. CASSADA: But it's certainly a problem having --

5 THE COURT: I think it sounded like they felt like  
6 they had a hot potato and they didn't want to --

7 MR. DAVID: Yeah, Your Honor. Mark David from  
8 Coltec and Rick Magee here who is also general counsel for the  
9 company in securities, probably knows more about securities  
10 law than anybody else in this courtroom. If he could come  
11 approach --

12 THE COURT: Sure.

13 MR. DAVID: -- and at least address the issue, make  
14 sure we cover it from a public filing standpoint.

15 MR. MAGEE: Thank you, Your Honor. We just want to  
16 make sure that we don't have a selective disclosure issue,  
17 since one shareholder now has information the other  
18 shareholders don't. So any kind of order you could enter  
19 requiring them to keep it confidential and return the  
20 information, we'll also try to get an agreement from them to  
21 do that.

22 THE COURT: Could you all draft an order, because I  
23 don't know anything about securities law.

24 MR. MAGEE: Yes, sir, we would be glad to do that.

25 THE COURT: Would do all the things you need to do

1 to protect. Because it doesn't sound like, you know, they  
2 wanted it anymore than you wanted them to have it. Okay?

3 MR. WEHNER: That's fine with us, Your Honor.

4 THE COURT: All right. Good. Thank you.

5 MR. DAVID: Thanks, judge.

6 THE COURT: All right. Let's come back at 9:30.

7 (A brief recess was taken in the proceedings at  
8 8:50 a.m.)

9 (Court reconvened at 9:31 a.m.)

10 DAVID GARABRANT,

11 Being previously duly sworn, was examined and testified as  
12 follows:

13 CONTINUED DIRECT EXAMINATION

14 BY MR. SCHACHTER:

15 Q. Good morning. Dr. Garabrant, when we concluded, we had  
16 gone through your initial summary slide, and we concluded with  
17 the literature that is most recent on gaskets and brake  
18 exposures.

19 I talked to you about the fact that you would be able to  
20 help to understand how the scientific method works for these  
21 issues and epidemiology. Have you prepared some slides that  
22 will help us understand that?

23 A. Yes.

24 Q. If you would, could you please explain how the scientific  
25 method works to resolve issues of causation?

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1 A. Yeah, the scientific method has been developed over, at  
2 least a couple of hundred years throughout all branches of  
3 science, and I think all scientists follow it, regardless of  
4 their discipline, with minor variations.

5 In medicine we typically start with case reports which  
6 are an initial observation that is typically written up and  
7 published of an interesting case. So I saw a patient who had  
8 this unusual presentation, and we found that he had a genetic  
9 abnormality in this chromosome, and I think that abnormality  
10 caused the disease.

11 That statement is a hypothesis. And a hypothesis is a  
12 speculative statement it is not scientific evidence. It's a  
13 statement of, I think this might be an important idea.

14 In order to prove up a hypothesis, you have to do a  
15 scientific study. Scientific studies collect data according  
16 to defined protocol. In medicine and biology, you have to  
17 have a control or a comparison group. After you've collected  
18 your data, you analyze it. Every branch of science relies on  
19 statistical methods now for data analysis, datasets get  
20 complex.

21 And when you're done analyzing your data, you have to  
22 answer a pretty straightforward question: Does the data  
23 support the hypothesis or not?

24 If you find evidence of an association between that agent  
25 or that genetic abnormality and risk of disease, you say, hey,

1 there's an association, I think I was right. The hypothesis  
2 appears to be true.

3 If you don't find an association, you say, nope,  
4 hypothesis is not supported by the data, it appears to be  
5 wrong, and you start over. That's what scientists spend their  
6 careers doing, going round and round doing -- raising  
7 hypotheses, designing studies, collecting data, analyzing it,  
8 and looking to see if their hypotheses are right.

9 Q. Now, what is the science of epidemiology?

10 A. Okay. The next slide. Epidemiology, the root word comes  
11 from epidemic, which is an unusual outbreak of disease in a  
12 population. And epidemiology is the study of the distribution  
13 of diseases, and of the causes or exposures in human  
14 populations, and it is done principally to understand or to  
15 discover the causes of disease in humans.

16 Q. When epidemiologists do studies, what in the first  
17 instance are they looking for statistically?

18 A. Well, as I pointed out in previous slide, when you do  
19 analytic epidemiology to discover causes of disease, you're  
20 looking for associations between the causes or the factors and  
21 risk of disease.

22 Q. There's a manual for judges by the Federal Judicial  
23 Center called the "Reference Manual on Scientific Evidence",  
24 it helps define terminology. Have I shared with you the  
25 definition of "association" from the manual?

1 A. Yes.

2 Q. Could you explain it to us, please?

3 A. Yes.

4 Q. Read through this for us and explain in scientific terms  
5 what this is saying.

6 A. Right. Okay. First off, I agree with this. This is  
7 right on target. So an association reflects the degree of  
8 statistical relationship between two or more events or  
9 variabilities. So between an exposure and a disease risk.  
10 Events are said to be associated when they occur more or less  
11 frequently together than one would expect by chance.

12 Now the critical element of that statement is the "more  
13 or less frequently together than one would expect by chance".  
14 The mere fact --

15 Q. Why is that important?

16 A. Well, the mere fact that I've seen a patient with an  
17 unusual genetic abnormality who has some unusual disease, is  
18 not an association. Because there is no way from that case  
19 report to assess how commonly that mutation and that disease  
20 occurred together by chance alone.

21 Q. Have epidemiologists developed statistical methodologies  
22 to help find out whether an association is something that's  
23 more frequent than one would expect by chance?

24 A. Yes. In fact, statisticians have developed the theory  
25 behind that, and epidemiologists use it universally.

1 Q. Are there -- what are the two kinds that are the most  
2 frequently discussed in the literature?

3 A. Yeah. We routinely calculate either P values. Which is  
4 the probability which you could have seen the association you  
5 saw by chance alone; or we calculate confidence intervals. By  
6 convention we use the 95 percent confidence intervals. We all  
7 see them in the newspaper and on the news every time there's  
8 an election and someone says, well, recent polls says 52  
9 percent of the voters intend to vote for Candidate A, with a  
10 margin of error of 3 percent. That margin of error is the  
11 pollster's way of saying confidence interval.

12 Q. Are there types of studies epidemiologists have developed  
13 in order to determine whether there's a statistically  
14 significant relationship?

15 A. Well, Mr. Schachter, let me separate that question into  
16 two separate issues. The first is to look for an association  
17 and to determine whether there is an association or not. The  
18 second is to evaluate the role of chance as a possible  
19 explanation for that association.

20 Q. Okay.

21 A. So those are related but separate actions which you  
22 have -- and you're responsible to do both as a scientist.

23 Q. Thank you for that clarification.

24 If you find an association, does that necessarily mean  
25 that you have a causal relationship?

1 A. No.

2 Q. Why not?

3 A. Well, there are a number of reasons associations occur  
4 that are not causal. The first is, they're just chance.

5 Q. Okay.

6 A. You have to evaluate that. In epidemiology we group the  
7 other causes into basically two categories, bias, some  
8 systematic error in the design or conduct or analysis of the  
9 data, and the other is confounding.

10 Q. What's confounding?

11 A. Refers to the existence of a third variable.

12 So you're looking to see whether there's an association  
13 between A and B. In other words, you know -- the idea is,  
14 does A cause B. There's some other factor C that is also a  
15 cause of B, that is associated with A.

16 Q. Okay.

17 A. If you don't adjust for factor C in your analysis, you  
18 can get the wrong answer and attribute the association between  
19 A and B to represent a causation when it's actually due to  
20 confounding by C.

21 Q. Okay.

22 A. So you have to look for and evaluate confounding, before  
23 you can reliably conclude that the association between A and B  
24 is meaningful with respect to causation.

25 Q. Sir, the reference manual defines several types of

1 studies, and I've got a diagram I've taken from the reference  
2 manual. What is a cohort study, sir?

3 A. Cohort study refers to the design that is laid out on  
4 this slide. You start with a defined population, and within  
5 that population you identify the group that has the exposure  
6 you're interested in, and the group that does not have the  
7 exposure. You then follow both groups over time. For cohort  
8 studies if you're doing cancer epidemiology that's typically  
9 decades. And as time passes, you watch to see how many people  
10 develop disease in the exposed group, and how many people  
11 develop disease in the non-exposed group.

12 If we might go on to the next slide, I would like to talk  
13 a little more about that.

14 Q. Do these cohort studies permit the determination of  
15 whether there's a statistically significant association?

16 A. Again, I need to break that down into, they allow you to  
17 look for evidence of an association. And if you see one, you  
18 then must evaluate whether it is statistically significant.

19 Q. Okay.

20 A. Two different steps.

21 Q. All right.

22 A. Could I come down to --

23 MR. SCHACHTER: Your Honor, may the witness be --

24 THE COURT: Sure.

25 THE WITNESS: Okay. In the previous slides we

1 talked about dividing the population into an exposed group and  
2 non-exposed group. And then we followed both groups over  
3 time. And as time passes, we look for the occurrence of  
4 disease. And so I've indicated the occurrence of disease here  
5 with the purple boxes.

6 We then look at -- we then can calculate a rate of  
7 disease, which is the number of occurrences of disease, but  
8 divided by the person time experience of the population.

9 And so I've actually put just 12 here to indicate 12  
10 people. But in fact what we do is we tally up the person time  
11 experience. How many 100,000 person years of observation  
12 there are in the denominator. The denominators are important.

13 So if you have two cases of cancer in 100,000 people  
14 followed for a year, that is a disease rate of 2 per 100,000  
15 or 2 times 10 with a minus 5th. And in the control group --  
16 or excuse me, in the non-exposed group, you also can calculate  
17 the disease rate as the number of occurrences divided by the  
18 number of person years of observation.

19 To calculate a measure of association, we routinely  
20 take the ratio of what happens in the exposed group. So let's  
21 say 2 per 100,000 person years, divided by what happens in the  
22 non-exposed group, 2 per 100,000 person years.

23 When the experience of both groups is identical, the  
24 ratio is 1 and that means there's no association. In other  
25 words, the exposed group did not have a higher rate of disease

1 than the non-exposed group. The rates are identical, the  
2 ratio is 1.0.

3 Q. All right. What happens if you have a different set of  
4 data from this it --

5 A. In this example, let's say 8 people got the disease in  
6 the exposed group, and 2 got it in the non-exposed group. And  
7 so if our denominator was instead of 12, it was 100,000 person  
8 years, we would say the rate is 8 over 10 to the 5th, versus 2  
9 over 10 to the 5th. The ratio is simply 8 over 2 or a four  
10 fold association.

11 In other words, the disease rate in the exposed group is  
12 four times the rate in the non-exposed group, we would say  
13 that is a four fold association. That's a positive  
14 association.

15 Q. That's how the statistics are done for a cohort study?

16 A. That's how you calculate a measure of association for a  
17 cohort study.

18 Q. All right. Now, the other type of study that's mentioned  
19 in the reference manual is a case controlled study. Does it  
20 differ in design from a cohort study?

21 A. Yes, it does.

22 Q. How is a case controlled study designed?

23 A. All right. Well, first off, the goal of doing a case  
24 controlled study, is the same as the goal of doing a cohort  
25 study. You want to see whether there is an association

1 between exposure and disease.

2 All right. We design it a little differently. We go out  
3 and identify cases of the disease. All right. So you have to  
4 work with a system of hospitals or a tumor registry or the  
5 registrar of the death certificates, and let's say you're  
6 interested in mesothelioma. You go out and assemble 200 or  
7 500 cases of mesothelioma.

8 You have to have a comparison group, and that's called  
9 controls. These are people who do not have mesothelioma. And  
10 typically they should be drawn from the same population that  
11 gave rise to the cases. And they should represent the person  
12 time experience of that population.

13 So now you're going to compare people with the disease,  
14 to people who do not have the disease, who are representative  
15 of the experience of the same population.

16 You then go back and reconstruct in an identical manner  
17 for cases and controls, their past exposure history. So you  
18 want to identify among the cases, how many have the exposure  
19 of interest among the controls, how many had the exposure of  
20 interest, you want to know at what age it started, how  
21 frequent it was, for how many years it lasted, perhaps some  
22 gauge of the intensity of the exposure. And you're going then  
23 to have to compare the exposure history of the cases, to the  
24 exposure history of the controls.

25 If I could have the next slide.

1 Q. Yes, sir. All right. What did you do with the data at  
2 that point?

3 A. So this is my diagram. You want to calculate a measure  
4 of association. All right. So here -- whoops, you're a  
5 little fast.

6 Q. Sorry.

7 A. Okay. So here I have my cases again. I've just made a  
8 diagram of 12 of them. They all have the disease. Here are  
9 my controls. None of them have the disease.

10 Next slide.

11 Now we go back and ask them, or look at their work  
12 records to find out how many had the exposure. I've indicated  
13 exposure with darker green figures. So among the cases, let's  
14 say four had the exposure, eight did not. We calculate the  
15 exposure odds.

16 Okay. Anyone who has ever bet on a horse race or a  
17 basketball game knows what odds are. It's the number of times  
18 you get what you want, divided by the number of times you get  
19 what you didn't want.

20 Okay. So we say, okay, among the cases, four had the  
21 exposure, eight did not. The exposure odds is .5. Among the  
22 controls, two had the exposure, 10 did not. The exposure odd  
23 is .2.

24 We then compare the experience of the cases to the  
25 experience of the controls by taking a ratio. It's an odds

1 ratio. So the odds in the cases divided by the odds in the  
2 controls, and in this example you can see it's a 2.5 hold odds  
3 ratio. That's a positive association.

4 What that means is, the cases were two and a half times  
5 as likely to have the exposure, as were the controls. That is  
6 a measure of association.

7 Q. We've had cited in the expert reports and we'll hear  
8 about lots of studies. Do they have a standard way of  
9 reporting the results? Can you explain to us what that is and  
10 how it's represented?

11 A. Sure. Regardless of how you do your study, it's  
12 customary in epidemiology to represent the measures of  
13 association in the same manner.

14 So 1.0 means no association at all. Greater than 1 is a  
15 positive association. Less than 1 is a negative or inverse  
16 association.

17 We typically write down the measures of association as  
18 relative risks or risk ratios, odds ratios, rate ratios.  
19 Different studies have different terminology, but they're all  
20 scaled the same way.

21 So we would write down the relative risk 3.1, and then we  
22 would calculate the confidence interval by convention, a  
23 95 percent confidence interval. In this instance, 2.3 to 4.2.

24 We customarily graph them. It's easier to see the  
25 pattern in the data in a graph than it is from looking at

1 numbers.

2 The graph I put up here, the blue square represents the  
3 relative risk or the measure of association. The black bar  
4 above and below it represents the 95 percent confidence  
5 interval.

6 Okay. When you have a bunch of studies, you graph them  
7 all. So the first one is graphed above, the second one with  
8 the relative risk is 1.5, and your confidence interval goes  
9 from 2.8 to 2.7 is graphed here.

10 Q. Now the first study, Study One, is that a statistically  
11 significant study as epidemiology understands that notion?

12 A. Yes. And you would click.

13 Okay. When the lower confidence interval is above 1,  
14 that was a statistically significant finding. And the concept  
15 is this, the data said there was a 3.1 fold association.  
16 We're -- we're 95 percent confident that the truth lies in the  
17 range defined by the confidence interval. Values outside of  
18 that confidence interval are not reasonably compatible with  
19 the data we saw.

20 Okay. So a value of 1, that is outside of the confidence  
21 interval, says that 1, no association is not compatible with  
22 the data we saw.

23 And if you did the calculation of the P value on the same  
24 set of data, you would find that the P value is well  
25 below .05. You would say that's a statistically significant

1 finding.

2 Q. What about Study Two?

3 A. When the confidence interval includes 1, what that's  
4 telling you is that 1.0, meaning no association, is reasonably  
5 compatible with the data we saw. That is not a statistically  
6 significant result because the confidence interval is 1.

7 If you did the P value calculation, you would find that  
8 the P value was greater than .05.

9 Q. All right. Sir, is there a way to accumulate the data  
10 from many studies on a subject, to come to a conclusion about  
11 the question in interest?

12 A. Yeah. Don't go ahead yet.

13 Yes. So what we do is, we typically graph them. Then we  
14 make a summary calculation that basically takes a weighted  
15 average of all of the relative risks, where the weights are  
16 proportional to the study size. Big studies have a lot of  
17 data, they have a lot of weight. Little studies have very  
18 little data, they have very little weight.

19 And we also account for the differences in the variances  
20 in the studies to come up with a summary relative risk which  
21 we refer to as meta relative risk. It's a weighted average  
22 across a bunch of studies.

23 Q. And the studies that do that, what are they called, sir?

24 A. Those are called meta-analyses.

25 Q. Thank you.

1 Do you have an example that's related to mesothelioma of  
2 how studies can or cannot tell us whether there's a  
3 significant association?

4 A. Yes. You go to the next slide.

5 All right. This is a slide that summarizes the world's  
6 literature on cigarette smoking and risk of mesothelioma.

7 So there are about a dozen studies that have looked at  
8 this. McDonald in 1970 found that the relative risk was .56,  
9 running .37 to .85. So that's a significant inverse  
10 association.

11 McEwen in '71 .5, not statistically significant.

12 You can glance down the list and see that the results  
13 vary, both above and beyond 1. Not very far away from 1.  
14 Look at the scale here .1. That's a 1/10th risk. Ten, that's  
15 a 10-fold risk.

16 Q. That's a logarithmic scale?

17 A. That's a logarithmic scale, right.

18 Q. Okay.

19 A. So 1/10 is the same distance from 1, as 10 is from 1.

20 Q. Does this slide give us a meta relative risk for the  
21 association between smoking and mesothelioma?

22 A. It does.

23 Q. And what is that?

24 A. At the bottom the meta relative risk is calculated --  
25 it's actually calculated in two different ways. For this one

1 the correct answer is here. So if you take a weighted average  
2 of all these relative risks, the weighted average is .94.  
3 It's almost identical to 1, and the confidence interval  
4 goes from .83 to 1.07. What this says is, there is no  
5 association between smoking and mesothelioma risk.

6 Q. Now sir, cigarette smoke from a medical standpoint, does  
7 it contain carcinogens?

8 A. Yes, it does.

9 Q. Are those carcinogens capable of causing genetic errors  
10 in human cells?

11 A. Yes.

12 Q. Do the carcinogens in cigarette smoke, reach the pleura,  
13 the site of origin of pleural mesothelioma?

14 A. Yes, they do. Black soot accumulates on the pleura in  
15 smokers.

16 Q. So if all that's true, doesn't that establish that  
17 cigarette smoke does cause mesothelioma?

18 A. Well, Mr. Schachter, you've got a hypotheses. Here's the  
19 data that tests your hypotheses. The answer is, the data does  
20 not support your hypotheses. This has been studied 10 times.  
21 These are very large studies, some of them, involving  
22 thousands and thousands of people. And the answer is, no.  
23 Your hypotheses is not supported by the data. It is not  
24 reasonable to conclude that smoking causes mesothelioma.

25 Q. And that's because of what?

1 A. Because of an abundance of epidemiological evidence that  
2 shows no association.

3 Q. Thank you, sir.

4 Now, have you applied these same meta-analysis  
5 methodologies to the issue of whether low dose chrysotile  
6 encapsulated products cause mesothelioma?

7 A. Yes.

8 Q. Okay. And in specifics, the product in question is what,  
9 brakes and gaskets?

10 A. Well, the occupation in which there is a low dose  
11 exposure to chrysotile, is vehicle mechanic. Because they  
12 handle brakes, clutches and gaskets, which have traditionally  
13 included chrysotile, in one or more formulations.

14 Q. Just as cigarette smoking has been studied, have vehicle  
15 mechanics been studied in many studies?

16 A. Yes, they have.

17 Q. Are you prepared to tell us about a few of them and the  
18 types of studies they are and who funded them?

19 A. Yeah.

20 Q. Issues like that?

21 A. Yeah. These slides go on for a number of pages, and I  
22 will not belabor them. I will talk quickly about a few of the  
23 studies.

24 What I've listed is the author, the year it was published  
25 and who funded it.

1           Okay. So the first was by Alison and Corbett McDonald  
2 published in 1980. It was a large case controlled study. In  
3 fact this cages all case controlled studies. And they look to  
4 see whether there was an association between mesothelioma and  
5 work in vehicle garages in North America. This was Canada and  
6 the United States.

7           They found the odds ratio of .91. Confidence  
8 interval .35 to 2.34. So the association was almost exactly  
9 1, not significant -- not statistically significant.

10          The second published study by Mary Jane Teta at Yale in  
11 1983, with funding from the National Cancer Institute, looked  
12 at the mortality data for the State of Connecticut and tallied  
13 up the occupations of mesothelioma cases and controls.

14          She found an odds ratio of .65, not significant.

15          Robert Spirtas at the National Cancer Institute.  
16 Funding, of course, from the National Cancer Institute. Big  
17 case control study of mesothelioma looking at the association  
18 between brake lining installation, or repair. No association.  
19 He didn't give all of his numbers, but his data was later  
20 analyzed by Pat Hessel, and was reported in detail.

21 Q. Let me ask about that Spirtas. Are those the numbers  
22 that Spirtas reported or the reanalysis?

23 A. No. These are the numbers reported by Dr. Spirtas in  
24 1985.

25 Q. Okay.

1 A. I'm not going through all of these. The point I want to  
2 make is that these studies have been done now over 33 years in  
3 the United States, in Germany, in British Columbia, Canada, in  
4 Spain. And as you look at the column of odds ratios, you see  
5 that they are all pretty close to 1. There are no  
6 statistically significant positive associations.

7 Next slide.

8 Q. Just a second, I have a question if I may.

9 A. All right.

10 Q. You mentioned QAMA, what is that?

11 A. The Quebec Asbestos Mining Association. Dr. McDonald's  
12 work was supported by the Quebec asbestos industry.

13 Q. Any of the other slides on that list, supported by  
14 anybody associated with industry or asbestos manufacturing?

15 A. No. These other five studies were all supported with  
16 government funding.

17 Q. Thank you. Now on the next slide, have you listed  
18 further case controlled studies that have looked into this  
19 issue of whether vehicle mechanics are at an elevated risk of  
20 mesothelioma?

21 A. Yes. Yes. Okay. So just pointing out that Denmark,  
22 United States, Great Britain, France, Mexico, the odds ratio  
23 is .7, .8, .4, 1.5, but not significant. And Anguilar-Madrid  
24 did the study, but didn't point out the odds ratio or the  
25 confidence interval.

1 As I mentioned earlier, Pat Hessel reanalyzed the  
2 Spirtas' data with a grant from Ford, GM and Chrysler, that's  
3 the only other industry-funded study. This is not data he  
4 collected, but he analyzed in detail, whether working with  
5 brakes was associated mesothelioma risk and it was not.

6 Q. All right. Are there any cohort studies that have  
7 addressed this issue?

8 A. Yes, there are four. Lesley Rushton in the United  
9 Kingdom studied the municipal bus garage maintenance men in  
10 London. Did not report active data, however.

11 Eva Hansen in Denmark studied the cohort of auto  
12 mechanics. Found one mesothelioma. Did not report out the  
13 odds ratio, confidence interval.

14 Gustafsson in Sweden studied bus garage workers in  
15 Stockholm, did not report the results.

16 Merlo in Italy, three years ago, municipal bus  
17 maintenance workers in Genoa. Found the standardized  
18 mortality ratio 1.27 not statistically significant.

19 Q. Okay. When they don't report out the data, can you use  
20 it in a meta-analysis?

21 A. Sometimes you can make reliable calculations, sometimes  
22 you cannot.

23 Q. Okay. For the data that you told us about, the case  
24 control, the cohort studies where there is a report of  
25 statistical association, the two types of studies mentioned in

1 the reference manual, what does the summary data look like?

2 A. So here are the studies, the same ones I've mentioned,  
3 McDonald, Teta, Woitowitz, Teschke, Agudo, et cetera. The  
4 meta relative risk is .96, almost exactly 1. Confidence  
5 interval .72 to 1.28. So there's no association.

6 Q. All right. Are there other types of studies that have  
7 data that bears on this issue, sir?

8 A. Yes. There are also what are called registry studies,  
9 essentially cancer registry studies that have data that is of  
10 some value, although it's not as useful as case control and  
11 cohort studies.

12 Q. Why is registry data not as useful as case control or  
13 cohort studies?

14 A. Registry data doesn't have denominators. So when you're  
15 talking about cohort studies and we talked about calculating  
16 disease rates, as cases per person years of observation,  
17 cohort studies have that, registry studies don't.

18 What registry studies have is reports of cancer. And so  
19 they will typically ascertain all cases of cancer in a state  
20 or in a nation, and report them out. You don't have any  
21 denominator of person years of experience. So you are forced  
22 to make what are widely regarded as less reliable  
23 calculations, such as proportional mortality ratio or  
24 standardized mortality odds ratios, without being able to  
25 actually calculate disease rates.

1 Q. Okay. Even though those are on a lower level of, I  
2 guess, hierarchy in epidemiological studies, have you taken  
3 those that report information that can be used into account?

4 A. Yes.

5 Q. Tell us about a few of those studies, sir?

6 A. Okay. These are the registry studies that there's  
7 actually two pages of this. So registries using the Swedish  
8 National Cancer Registry, the Mesothelioma Registry in the  
9 United Kingdom, repeated reports from that. Our own National  
10 Institute for Occupational Safety and Health using death  
11 certificates in the National Occupational Mortality Survey.

12 And some of these studies did not report out any measure  
13 of association, three of them did.

14 So Coggon, proportional mortality ratio .46, a  
15 significant deficit of inverse relationship.

16 McElvenny also in Great Britain and update Coggon  
17 earlier. PMR .48, almost the same answer. In the United  
18 States .83, not statistically significant.

19 You can go to the next slide.

20 Q. Just a second. Let me ask about this.

21 Are any of these studies funded by industry or anybody  
22 associated with the asbestos manufacturing?

23 A. No.

24 Q. Okay. And the other studies?

25 A. Okay. More recently, that British Health and Safety

1 Executive, essentially an update of the dataset reported by  
2 McElvenny, but not overlapping so it's an independent  
3 observation. Same answer .49, .73.

4 This is the State of Washington, same analyzed death  
5 certificates over the entire state of a 50 year period.  
6 PMR .73, not significant.

7 Then Roelofs just came out a few weeks ago using the  
8 Massachusetts Cancer Registry, found a statistically  
9 significant association standardized mortality odds ratio of  
10 2.1. Confidence interval 1.1 to 4.0.

11 Q. And the other studies you talked about have a PMR.  
12 What's that, just so we have the terminology right, sir?

13 A. That's a proportional mortality ratio. Essentially what  
14 you're doing is saying among cancer -- among mesothelioma --  
15 among mesothelioma deaths, what proportion -- I'm not saying  
16 it right.

17 It's essentially comparing the proportion of deaths that  
18 are mesothelioma among motor vehicles mechanics, to the  
19 proportion of deaths that are mesothelioma in all other  
20 occupations. So it's a comparison of proportions, there's no  
21 denominator.

22 Q. What's the SMOR?

23 A. Standardized Mortality Odds Ratio. A similar  
24 calculation, essentially comparing the proportion of deaths  
25 among mesothelioma who have worked as automobile mechanics, to

1 the proportion of deaths among some other causes of death who  
2 have worked as automobile mechanics.

3 Q. When we put the registry study data in with the case  
4 control and cohort study, how does that alter the picture if  
5 at all?

6 A. Well, you can see that all the case control cohort  
7 studies are listed, now we've added the registry studies, so  
8 there's more data.

9 The correct meta relative risk is the lower one. And  
10 answer is .87 is not statistically significant. The  
11 confidence interval goes from .66 to 1.6. So there is still  
12 no association between work as a motor vehicle mechanic, and  
13 risk of mesothelioma, even though there is one statistically  
14 significant positive study now.

15 Q. Thank you, sir.

16 Have you performed similar analysis for us in this case  
17 dealing with other professions?

18 A. Yes.

19 Q. Have we got a few slides that just summarize them?  
20 They're in detail in your report, right?

21 A. Yes.

22 Q. Well, let's start with plumbers and pipefitters, it's an  
23 occupation where people use gaskets. Have you looked at the  
24 world literature on that, looking for the case controlled  
25 studies, the registry studies in exactly the same way?

1 A. Right. Case control, cohort and registry studies.  
2 There's quite a bit of data on plumbers and pipefitters, I  
3 don't know, maybe 20 or so studies.

4 The summary or meta relative risk is almost five, 4.95 is  
5 highly significant. A confidence interval 3.83 to 8.39. You  
6 can see that that is significantly different from the no  
7 association mark. So plumbers and pipefitters -- and this is  
8 all over the world, are at about a five fold risk of  
9 mesothelioma.

10 It's -- you can look at the data from the individual  
11 studies and see that all of them show positive associations,  
12 and almost all of them show statistically significant positive  
13 associations.

14 Q. Are -- I guess one criticism that sometime's rendered  
15 about the brake studies is that there are studies that cannot  
16 detect a significantly significant association if that exists,  
17 is that accurate?

18 A. No, that is not accurate. The studies that have found  
19 the significant association for plumbers and pipefitters are  
20 the same studies. So it's the Teta studies, the Spirtas, the  
21 Coggon, the Teschke, the Agudo, the McDonald, the Health and  
22 Safety Executive, Peto and Rake, Rolland, National  
23 Occupational Mortality Survey and Washington State Department  
24 of Health Sam Milham, as well as Carl Roelofs.

25 So these studies have adequate power, many of them, to

1 find statistically significant associations when they exist,  
2 and they have reported them. They did not find those  
3 associations for motor vehicle mechanics.

4 Q. Let's just do a couple more briefly. We have limited  
5 time in our case, I apologize. What did you find for  
6 boilermakers?

7 A. Boilermakers, the meta relative risk is about 4.5, highly  
8 significant, by eight or nine studies. Same authors, Spirtas,  
9 Coggon, Teschke, Rolland, et cetera.

10 Q. Now, when you did have data about an occupation from a  
11 different study, you of course included it; is that correct?

12 A. I'm not sure I understand.

13 Q. Well, you said the same studies. Some of these studies  
14 did not have data on brake workers, right?

15 A. That's correct. So for example, Danielson didn't cover  
16 brake workers. Pan, don't remember. Tomioka I think covered  
17 brake workers.

18 Q. What about shipyard workers, what's the relative risk?

19 A. Shipyard workers, five fold meta relative risk, highly  
20 significant. Almost every study shows a statistically  
21 significant positive association. Same authors. Same  
22 research studies reporting these out as we saw for brake  
23 workers.

24 Q. Electricians?

25 A. Electricians lower risk 3.2, highly significant. I might

1 mention a 3.2 fold risk is still a strong risk factor. I  
2 don't -- I try not to do things that put me at three fold risk  
3 for cancer. That's a big one.

4 Many studies, many statistically significant findings,  
5 three fold risk. Same authors, same papers.

6 Q. And how does this fit into the issue of exposure to  
7 insulation products? Why --

8 A. Well, electricians routinely work in the construction  
9 industry, and they routinely, in the past, have to crawl  
10 around up in the plenums, up among the insulation. And they  
11 have to remove the insulation to run their wires and bore  
12 holes in walls to stream wires. And so they often have  
13 exposure to thermal insulation. And so as part of  
14 construction trades, they often end up being exposed to  
15 thermal insulation, not to mention the electrical equipment is  
16 often insulated as well so it doesn't catch fire.

17 Q. In your report did you conduct a similar meta analysis  
18 for each of these occupations, sir?

19 A. Yes. This is a slide we showed yesterday afternoon. Now  
20 we have a little better background about what this actually  
21 represents. So these are the meta relative risks for each of  
22 about 30 different occupations. Showing in their rank from  
23 high to low. Showing that the people who are exposed to  
24 thermal insulation, such as insulators, shipyard workers,  
25 plumbers, pipefitters, boilermakers, sheet metal workers

1 electricians, furnace operators, et cetera, are at high risk  
2 of mesothelioma, in contrast to vehicle mechanics who are not  
3 at any significant risk of mesothelioma. And in terms of  
4 risk, look just like teachers and office and clerical workers.

5 Q. Sir, I see carpenters are listed here a couple of times.  
6 Can you explain why?

7 A. Yeah. We separated out carpenters in Great Britain and  
8 Australia, from carpenters in other areas in Europe, and  
9 carpenters in the United States.

10 Q. Why is that?

11 A. And the reason is the building codes in Great Britain, as  
12 I understand them, for years required the use of asbestos  
13 insulation board. That was an amosite board.

14 And so carpenters routinely cut and built things with AIB  
15 as they call it, asbestos insulation board. It was amosite  
16 exposure. And so we do separated out British and Australian  
17 carpenters from the risk. And the risks appear to be  
18 different. Certainly comparing U.S. carpenters to British  
19 carpenters.

20 Q. All right. Sir, is there another scientific discipline  
21 to which your data, another set of data to which your  
22 epidemiological data can be compared that may corroborate or  
23 not corroborate what you found? I'm referring to this.

24 A. Thank you.

25 Q. I'm sorry for my bad question. I'm not a scientist.

1 A. All right. Yeah. The next thing we did was, we looked  
2 to see whether these meta relative risks that we calculated  
3 across occupations, correlated with lung fiber burdens of  
4 amphiboles. And the group at Duke, Roggli and Sporn  
5 (phonetic) have published the lung fiber burdens in a list of  
6 occupations in the peer-reviewed literature. So we took that  
7 evidence of lung fiber burden by occupation and plotted it  
8 against our meta relative risks that I showed on the previous  
9 slide.

10 Q. What did that show? What are the scales here?

11 A. Okay. On the horizontal scale, this is the amosite and  
12 crocidolite fiber burden per gram of lung tissue. It's on the  
13 log scale. And on the vertical scale, this is the relative  
14 risk also on the log scale. When you plot them on the long  
15 log scale, you can get a reasonably good linear fit using  
16 linear regression.

17 What it shows is a positive association. It is  
18 statistically significant with a P value of .02, and a  
19 reasonably good R square, which is a measure of how much of  
20 the variation in the Y axis is explained by the fit.

21 And so what it says is, there's a significant correlation  
22 between lung fiber burden of commercial amphibole fibers, and  
23 relative risk of mesothelioma across a wide range of  
24 occupations. The highest risk occupation, insulators, also  
25 has the highest lung fiber burden. When we get down here to

1 vehicle mechanics where their relative risk is slightly below  
2 1, they have very little amphibole in their lungs, they have  
3 the lowest.

4 I'm sure everyone remembers that the log of 1 is zero,  
5 that's why on the log scale is zero with a risk of 1. Okay.

6 Q. Thank you, sir. I have a few discrete questions about  
7 your vehicle mechanic studies.

8 I noticed that none of the studies that are included are  
9 case reports; why not?

10 A. You can't include case reports because you cannot  
11 calculate a measure of association from a case report. And  
12 you cannot calculate -- since there's no measure of  
13 association, you can't calculate a confidence interval or a P  
14 value.

15 Q. Is there an example in the literature on vehicle  
16 mechanics that illustrates the proper use of a case report and  
17 how that is followed up?

18 A. Well, there are case reports in the literature if you go  
19 to the next slide.

20 This is a case report by Arthur Langer in 1982 where he  
21 wrote up a case of a mesothelioma in a brake repair worker.  
22 So it's a case report it raises a hypotheses that brake repair  
23 work might be a cause of mesothelioma.

24 Even then he commented, the risk of malignant asbestos  
25 disease among brake maintenance and repair workers seems to be

1 low, but mortality data has yet to be fairly evaluated. This  
2 is 1982, the only published available study at that time was  
3 McDonald in 1980. So this was correct, didn't know the  
4 answer.

5 Q. Did he write later on it after some research had been  
6 done?

7 A. Dr. Langer in 2003 published a paper looking at the  
8 biological potential of chrysotile asbestos to cause  
9 mesothelioma and other diseases, and now commented, having  
10 reviewed some of the epidemiology brake installers and  
11 maintenance workers appear to exhibit no increased risk of  
12 mesothelioma, and went on to say, proportional mortality  
13 studies in groups of workers engaged in automotive brake  
14 repair have shown that the cancer deaths and for mesothelioma  
15 specifically, were equal to or less than values calculated for  
16 their respective control groups.

17 So the point is now, after collecting data that can test  
18 the hypotheses raised by the case report, the data doesn't  
19 support the hypotheses.

20 Q. Sir, I need to you ask a little about your Goodman  
21 article. This was how long ago?

22 A. Nine years now.

23 Q. And this article did what, sir?

24 A. My colleagues and I published a meta-analysis of  
25 mesothelioma and lung cancer among motor vehicle mechanics.

1 It was very similar work to what I just presented just a few  
2 minutes ago.

3 Q. And there's a quality scale that appeared in that report.  
4 Can you explain to us why in doing a meta-analysis, it's  
5 important to analyze the quality of the studies upon which  
6 you're relying?

7 A. Yeah, in doing a meta-analysis, it is important to  
8 evaluate the quality of the individual studies. That's one of  
9 the recommendations in the scientific community, that you want  
10 to focus on studies that appear to be more reliable, rather  
11 than studies that are less reliable data, and less reliable  
12 methods.

13 So when we did the study nine years ago, I'll just refer  
14 to it as the Goodman study. We had a 10 factor quality  
15 scoring system. And we rated each study on their quality.

16 You can see here I've represented the minimum score you  
17 could get a minus six, and a maximum a positive eight. So it  
18 was a scoring system that was centered close to zero, although  
19 it wasn't intended to center on zero, doesn't matter. The  
20 point is, you could get points or lose points for each of 10  
21 different study design factors.

22 Q. All right. And so your quality scoring rates are in the  
23 Goodman article, and I believe that there's some comment by  
24 committee experts on that. I just want this to be clearly  
25 understood. Have you also assessed the quality of the studies

1 appeared since Goodman included in the analysis that you  
2 presented to the court today?

3 A. Yes, I have.

4 Q. And does this reflect those scores?

5 A. Right. So these are the studies published since the  
6 Goodman article. And I have scored them, the Rake study in  
7 fact has the best score of any study in the literature, it got  
8 a six. It's a very well done study.

9 Rolland and Merlo. Rolland was case control, a one,  
10 Merlo a three. Then the two registry studies got a minus one.

11 Q. All right. And is it -- is there material even in the  
12 registry study like the recent Roelof study that helps explain  
13 why it's not of the same caliber as a case control study such  
14 as Rake and Peto?

15 A. Yeah. Roelofs suffers from one of the problems that is  
16 typical of registry studies. What she knew about the  
17 occupational history of the mesothelioma cases was simply  
18 whatever they reported at the time of diagnosis to the  
19 hospital.

20 So when you go into the hospital they often ask you, what  
21 sort of work do you do; where do you work. That's what she  
22 had. So that's not the same as a lifetime occupational  
23 history or a history that probes for exposure to asbestos in  
24 the past.

25 Q. And so when this says the major limitation of a cancer

1 registry based surveillance strategy, is that recorded usual  
2 occupation and occupation is a limited surrogate for detailed  
3 exposure history. Reported usual occupation and history may  
4 miss or mask the true source of asbestos exposure. What are  
5 we talking about here? If somebody comes in and tells the  
6 hospital, look, I was a brake worker. Why isn't that enough?  
7 A. Correct. So -- so, you know, you're in the hospital.  
8 You're getting worked up for pleural effusion. They ask you,  
9 what sort of work do you do. You say, I'm a vehicle mechanic.  
10 There's nothing here that might have captured that you might  
11 have spent four years in the Navy in a boiler room.

12 Q. I see.

13 A. Or something that you did early in life, this would miss  
14 it.

15 Q. All right. Now, as opposed to this, the study that you  
16 scored very highly was Rake and Peto, what kind of information  
17 was that based on?

18 A. Rake and Peto were much more rigorous in getting  
19 occupational and non-occupational exposure histories. So this  
20 is what they did for both their cases and controls, they sent  
21 them a pre-interview postal questionnaire requesting a  
22 lifetime occupational and residential history.

23 They then did a telephone interview which inquired in  
24 detail about that history. Also got questions on smoking  
25 history, do it yourself activities, possible environmental

1 exposures, cases were asked about various asbestos exposures  
2 in each job, depending on the type of work. These included  
3 work with asbestos insulation board, lagging, spray coating,  
4 cement insulation, deep protection, gaskets, textiles and  
5 brake linings. For each job, the duration, description and  
6 occupational code were recorded, together with the frequent of  
7 direct or bystander asbestos exposure.

8 This is a careful and thorough exposure history. That's  
9 not what you get from registry studies.

10 Q. Some of the experts for the committee will opine on low  
11 dose exposure products like brakes and gaskets based upon --  
12 I'm sorry. We already had the conclusion from Rake and Peto,  
13 right? They found no association, right?

14 A. Yes.

15 Q. I'm sorry. There's a study called Iwatsubo. Can you  
16 explain to us what that study was, and why you don't really  
17 use it to determine whether gaskets are a problem?

18 A. Okay. Iwatsubo was case a controlled study done in  
19 France, that became the basis of what eventually turned into a  
20 very large analysis -- turned into a large registry of  
21 mesotheliomas in about 25 percent of the French population.

22 Iwatsubo had -- so essentially what they had was cases of  
23 mesothelioma and controls who did not have mesothelioma. They  
24 had no measurements of asbestos levels in any job or in any  
25 setting. So instead of using measured levels, they made

1 estimations of likely exposures based on experts who made  
2 subjective estimates and assigned weighting factors to  
3 probability of exposure, frequency of exposure, and estimates  
4 of concentration.

5 That weighted index that took into account probability,  
6 frequency, concentration and also the duration of each person  
7 who reported exposure, they expressed in terms of fibers per  
8 milliliter years, but they put in quotation marks, because it  
9 really wasn't based on any measurements, and they did not  
10 represent that they actually knew what the concentrations  
11 were.

12 Q. Okay. You mentioned it was ongoing. Is there a study  
13 from the same basic population in the area and authors that is  
14 more probative of brakes and gaskets and low dose products?

15 A. Well, I should point out that Iwatsubo actually had  
16 information on brake mechanics, but they didn't report out any  
17 measure of association.

18 Q. Okay.

19 A. This was followed up by a much larger study which has now  
20 been published by Rolland. And if you look at the authors,  
21 many of them are the same as on the Iwatsubo paper. And so  
22 this now became a multi-center population base case controlled  
23 study within the French Mesothelioma Registry, and this  
24 reported data from '98 to 2002. It covers about a quarter of  
25 the population of France now. We go on.

1 Q. Okay. And they reported meta -- relative risk?

2 A. This is not meta-analysis.

3 Q. I'm sorry.

4 A. They reported the odds ratios for each of the long list  
5 of occupations from their case control study.

6 Q. They used the same kind of chart you used in the court?

7 A. Well, they represented them in the same manner. This is  
8 fairly customary. So you have the odds ratio with the  
9 confidence interval above and below it. And then the odds  
10 ratio numerically and confidence numerically at the far right.

11 The statistically significant associations are in bold  
12 type. The non-significant ones are in the faint type, which  
13 means you can't read them. But motor vehicle mechanics are  
14 right here. And so here are the results for motor vehicle  
15 mechanics. You can see it's not significant. The odds ratio  
16 is 1.5. Confidence interval .76 to 2.95.

17 This result is in the meta-analysis that we -- that I  
18 showed you just a few minutes ago.

19 Q. All right. There's also a similar registry in Germany;  
20 is that correct? Oh, I'm sorry. You had a point you wanted  
21 to make about Rolland, what they talked about on brake  
22 mechanics when they wrote up the report, right?

23 A. Yes. They commented in this paper, nearly all male cases  
24 were end users of asbestos-containing materials, especially  
25 insulation products in several occupations or industries at

1 risk. In contrast, as reported elsewhere, they cite Teschke  
2 and Agudo. Occupational activities involving asbestos  
3 friction products repair of motor vehicles and motorcycles  
4 were not associated with significantly high risk of  
5 mesothelioma.

6 So these are the same studies that we saw in the  
7 meta-analysis that I created.

8 Q. And there's a German registry, right? And there's been  
9 reports from it too, correct?

10 A. That's correct. And there is a case control analysis  
11 based on those recorded mesothelioma cases. This was reported  
12 out by Rodelsperger. Of interest, in addition to doing the  
13 case control study, Rodelsperger also had autopsies on 66 of  
14 the mesothelioma cases, which showed a strong association  
15 between the amphibole fiber content in the lungs and  
16 mesothelioma risk, but no relationship for chrysotile.

17 Q. All right. Did this study, though, report on motor  
18 vehicle mechanics separately?

19 A. Well, Rodelsperger and Woitowitz reported on motor  
20 vehicle mechanics in a separate paper from the case control  
21 study.

22 Q. And that was the --

23 A. So this is 1994, Woitowitz and Rodelsperger, they found  
24 no evidence that car mechanics are exposed to increased risk  
25 of mesothelioma, even if they do brake repairs. But asbestos

1 exposure in other employment is an important confounding  
2 factor. So if there's a mesothelioma risk of car mechanics,  
3 it would be small it would not be detectable.

4 The point here is that if you're going to look at the  
5 association between mesothelioma and work as a car mechanic,  
6 car mechanics have often worked in other exposed jobs. People  
7 in mechanical skills often work as millwright machinists, they  
8 end up in an industry where they often have had exposure to  
9 thermal insulation products on other jobs. You have to  
10 control for that potential confounder to get the right answer.

11 Q. Thank you, sir. One other issue is this issue of  
12 idiopathic or just background rates of mesothelioma.

13 Has there been published literature that has addressed  
14 that issue, sir?

15 A. There's actually a substantial body of literature that  
16 has tried to estimate how much mesothelioma occurs in the  
17 absence of asbestos exposure. One of the best done studies  
18 was Spirtas, the same author we talked about, same study.

19 Q. Is he associated with industry in any way, this study  
20 funded by industry or anything like that?

21 A. Dr. Spirtas spent his career at the National Cancer  
22 Institute, which is part of the National Institutes of Health.  
23 No, he is not affiliated with industry to the best of my  
24 knowledge.

25 Q. Okay. What did he report in 1995?

1 A. He calculated what epidemiologists call attributable  
2 risk. In other words, what proportion of the cases are  
3 attributable to asbestos exposure.

4 For men with pleural mesothelioma, he calculated out  
5 88 percent were attributable to asbestos. For peritoneal  
6 mesothelioma, it was 58 percent in men. For women, pleural  
7 and peritoneal combined, it was 23 percent.

8 So depending on sex and depending on site it varies.  
9 His overall estimate for pleural mesothelioma was 88 percent.  
10 Which means that 12 percent had no known history of exposure  
11 to asbestos.

12 Q. And you mentioned there's been a lot of writing on this.  
13 Can you -- do you have a recent example?

14 A. Craighead and Gibbs in their textbook commented on this.  
15 Although -- this is page 191. Although a strong link between  
16 malignant mesothelioma and amphibole exposure is established,  
17 not all cases are etiologically related to asbestos. In the  
18 adult male population, 20 to 40 percent of malignant  
19 mesothelioma are idiopathic. And in women in the United  
20 States, the incidence of spontaneous idiopathic malignant  
21 mesothelioma exceeds 50 percent.

22 Q. Spontaneous mesothelioma means, it just happens?

23 A. It means it's idiopathic.

24 Q. Sir, your meta analysis, your report contained charts  
25 like the ones we've gone through. After your reports were

1 published, the Roelofs paper came out, right?

2 A. Yes. Roelofs just came out a few weeks ago.

3 Q. And did you update your charts to reflect that to include  
4 the data from Roelofs to the extent it was reported?

5 A. Yes. The charts that I have shown in slides today  
6 include Roelofs, whereas my report did not, as Roelofs was not  
7 available.

8 Q. I'm going to hand you GST Exhibit 15786, which are your  
9 updated charts. Could you verify that they are, sir?

10 I'll give a copy to counsel.

11 THE COURT: What was the number again?

12 MR. SCHACHTER: It's 15786. GST 15786.

13 THE WITNESS: Yeah. These are my updated graphs  
14 that include Roelofs.

15 MR. SCHACHTER: Your Honor, at this time I move the  
16 admission of GST 15786.

17 MR. GEORGE: We would of course object to its  
18 admission to evidence, understanding the court's ruling about  
19 using it for 104 purposes.

20 THE COURT: We'll admit it into evidence. Overrule  
21 the objection.

22 (Debtor's Exhibit No. 15786 was received into  
23 evidence.)

24 MR. SCHACHTER: Your Honor, just so the record is  
25 clear on the 104 submission of his report, I offer GST

DIRECT - GARABRANT

311

1 15156 --

2 THE COURT: I'll admit the charts, we've been  
3 through those. The report we'll accept for 104 purposes.

4 MR. SCHACHTER: They are, to save time for further  
5 witnesses, can we just apply that to all of our reports?

6 THE COURT: That's fine, yes.

7 MR. SCHACHTER: And it would include rebuttal  
8 reports?

9 THE COURT: Yes.

10 MR. SCHACHTER: Thank you, Your Honor.

11 MR. FINCH: Your Honor, am I correct that the cross  
12 (phonetic) rule is in effect that we can put in our reports  
13 for 104 purposes?

14 THE COURT: Sure.

15 MR. SCHACHTER: Actually we attached all their  
16 reports too, so the court would have a complete record upon  
17 which to decide *the Daubert* issues. So they're already there.

18 Thank you, Your Honor. I pass the witness.

19 THE COURT: Okay. Cross examination.

20 CROSS EXAMINATION

21 BY MR. GEORGE:

22 Q. My name is Jonathan George. We've met before, correct,  
23 Dr. Garabrant?

24 A. Yes, we have. Good morning.

25 Q. I want to ask you really quick about this brake study.

Laura Andersen, RMR 704-350-7493

1           You commented on the fact that through these phone  
2       questionnaires, the authors solicited detailed information  
3       about the job duration, description, frequency of asbestos  
4       exposure. None of that information with regard to any  
5       exposure to friction products is actually reflected in this  
6       study correct? There's no table that tells us how many of the  
7       interviewees had exposure to friction products? How many  
8       controls did, correct?

9       A. I would have to look at the technical report. Let me get  
10      it out.

11      Q. Now the technical report is not the published report that  
12      you put up before the court, correct?

13      A. Well, it's the accompanying technical report published by  
14      the Health and Safety Executive in Great Britain and it runs  
15      about 120 pages. Let me get it out and answer your question.

16      Q. Let me ask you this. My question is more specific to the  
17      peer-reviewed published report, the actual study itself which  
18      appeared in the *British Journal of Cancer* in 2009, ran pages  
19      1,175 to 1,183. In that, there's no chart that tells us  
20      anything about the exposure that any of the mesothelioma  
21      patients had to friction products, correct?

22      A. The published report is eight or nine pages. You cannot  
23      publish all the detailed results in the peer-reviewed  
24      literature. There is a technical report that runs about 110  
25      pages that gives far more detail. Let me get that out and --

1 Q. Respectfully, I'm not interested in that. I'm interested  
2 in the peer-reviewed published report.

3 If I was looking for a chart in here that told me how  
4 many cases, how many controls did brake work, and whether in  
5 fact it was actually brake work, or whether they were  
6 classified as some other occupation like a garage worker or a  
7 automobile mechanic or a motor vehicle mechanic, that  
8 information is not contained within the confines of this  
9 published report, correct?

10 A. There are two published reports. One by the government  
11 of Great Britain that is widely available. Anyone who reads  
12 the peer-reviewed published paper by Christina Rake is  
13 referred back to the full report for further details.

14 Q. So I am correct that in the peer-reviewed published  
15 report that information is not contained, correct?

16 A. The report published by Peto and Rake by the Health and  
17 Safety Executive I believe is also a peer-reviewed published  
18 report.

19 Q. Still not answering my question.

20 In the peer-reviewed published report by Peto and Rake,  
21 there is no table that tells us how much exposure any of the  
22 mesothelioma patients had to friction products, correct?

23 A. Sir, we're trying to separate out two peer-reviewed  
24 published reports on the same study; one is nine pages long,  
25 one is 110 pages long. If you want the details, you have to

1 go to the second one as well. You can't look at it just from  
2 the nine page summary.

3 Q. Now Dr. Garabrant, you talked about your CV. Out of your  
4 185 peer-reviewed publications, only four of them have dealt  
5 with asbestos, correct?

6 A. I think only four of them mention asbestos in the title.  
7 There are a number of other studies that I've done and reports  
8 and papers I've written that have dealt with asbestos.

9 So, for example, my cohort mortality study of UAW Ford  
10 members, also looked at asbestos exposure in relation to  
11 cancer deaths. But there's nothing in the title that says  
12 asbestos.

13 Q. And in the four of your 185 peer-reviewed publications  
14 where it's mentioned in the title, you've essentially  
15 published on two issues with regard to asbestos. One is the  
16 relationship to colon cancer. And two is your motor vehicle  
17 study, correct?

18 A. No, sir. That's not accurate.

19 Q. Well, your first one was an Occupational Asbestos  
20 Exposure Mesothelioma Risk in Los Angeles County?

21 A. Yes.

22 Q. And that was just a job matrix exposure where you tried  
23 to figure out what the relationship was between jobs with  
24 asbestos exposure and the development of mesothelioma?

25 A. I would characterize it somewhat differently. I was at

1 USC School of Medicine at that time, and we sought to look at  
2 the Los Angeles County Tumor Registry data, which also had  
3 occupation and industry at the time of diagnosis in it.

4 And to see whether we could use that data and create an  
5 overall, what's called job exposure matrix to estimate  
6 exposure to asbestos in combinations of jobs and industries,  
7 to see if we could identify using the tumor registry data,  
8 occupations that had asbestos exposure that were at increased  
9 risk of mesothelioma.

10 So it was a very broad investigation into the uses of  
11 registry data and ways to use that data to find mesothelioma  
12 risks by occupation.

13 Q. And you ultimately concluded you couldn't use the data in  
14 that way, correct?

15 A. I wouldn't say we couldn't use it. We found that it  
16 was -- registry data has a lot of occupational  
17 misclassifications. It's difficult to get very strong  
18 associations out of that type of data. That's essentially  
19 what we found. It wasn't that we couldn't use it, it just  
20 didn't appear to be terribly useful.

21 Q. You didn't, in that study, reach any conclusion about  
22 friction product exposures or gasket exposures, correct?

23 A. I don't recall having done so, no.

24 Q. Your next two studies had to deal with colon cancer,  
25 correct?

1 A. Yes.

2 Q. And then your last study was the meta-analysis that you  
3 talked about on direct, correct?

4 A. Of the four peer-reviewed studies that mention asbestos,  
5 yes.

6 Q. Then you had two non-peer reviewed publications which  
7 were both essentially letters to the editor?

8 A. Yes.

9 Q. Now you don't have a Ph.D in epidemiology, correct?

10 A. No.

11 Q. You have a Master's degree, because you got your Master's  
12 in public health at Harvard, correct?

13 A. I have a Master of public health, and I have spent my  
14 career doing epidemiology, teaching epidemiology and studying  
15 epidemiology.

16 Q. Now, you would agree that you have no background in  
17 industrial hygiene?

18 A. Actually I took industrial hygiene when I was at the  
19 Harvard School of Public Health. I took a graduate course in  
20 it.

21 Q. But you're not a industrial hygienist?

22 A. I would not hold myself out as an industrial hygienist.

23 Q. You haven't participated in any studies that deal with an  
24 industrial hygiene of gaskets, correct?

25 A. I don't believe so.

1 Q. You've not published any papers involving the health  
2 consequences from the use of industrial gaskets, correct?

3 A. I have not.

4 Q. Now you have been involved in litigation since the mid  
5 1980s, correct?

6 A. Yes.

7 Q. You, since 2002, you've been deposed about 174 times, and  
8 you've testified at trial about 36 times, correct?

9 A. I don't know if that's correct. But if you have taken  
10 that from my list of testimony, I will vouch that my list of  
11 testimony is correct.

12 Q. Okay. And you've testified on behalf of the petroleum  
13 industry in a dozen or so leukemia cases, correct?

14 A. I have testified in cases where it was alleged that  
15 products such as diesel fuel, gasoline, toluylene, xylene,  
16 paint thinner, mineral spirits caused leukemia because of  
17 traces of benzene in them. I have testified on behalf of  
18 defendants including the oil industry in those cases.

19 Q. Among those defendants, British Petroleum, Chevron and  
20 Exxon, correct?

21 A. BP and Chevron, yes. I don't recall having testified on  
22 behalf of Exxon.

23 Q. Now you testified on behalf of Mobile Oil and All Waste  
24 in a case involving death from exposure to toxic vapors at the  
25 mobile refinery, correct?

1 A. I'm not sure which case you're referring to.

2 Q. You've testified on behalf of Lockheed in a series of  
3 cases involving exposure to solvents at the Lockheed facility,  
4 correct?

5 A. I've testified on behalf of Lockheed in a series of cases  
6 alleging cancer related to trichloroethylene, yes.

7 Q. And you testified on behalf of Chevron in a case  
8 involving paraquat?

9 A. Yes. Paraquat is an herbicide -- it was used to clear  
10 weeds from highway right of ways. And yes, I testified on  
11 behalf of Chevron.

12 Q. You testified on behalf of Baxter and Health Port in a  
13 case involving an allergic reaction to latex gloves, correct?

14 A. Yes, I have.

15 Q. And you testified on behalf of Lincoln Electric and  
16 others, in the case involving exposure to manganese from  
17 welding rods?

18 A. I've testified on behalf of a number of welding rod  
19 defendants in cases that alleged that Parkinson's disease was  
20 caused by welding rods, which I don't believe is true. So yes  
21 I testified on behalf of the defendants.

22 Q. Now you also testified in asbestos litigation, correct?

23 A. Yes.

24 Q. In fact, the first and last time you testified for a  
25 plaintiff in a third party lawsuit where asbestos companies

1 were sued, was a colon cancer case in 1984, correct?

2 A. That is correct.

3 Q. You've never testified on behalf of a plaintiff in a  
4 mesothelioma case, correct?

5 A. I have not.

6 Q. And the first time that you testified on behalf of the  
7 friction product manufacturers in lawsuits, was sometime  
8 around 2001 and 2002, correct?

9 A. Yes.

10 Q. And at that time when you first testified, you had not  
11 published anything in the peer-reviewed literature about  
12 friction products and mesothelioma, correct?

13 A. That's correct.

14 Q. You were a co-author of a paper in 2004 about friction  
15 products, the one we talked about, correct?

16 A. As a co-author of the Goodman meta-analysis, yes.

17 Q. And that was a meta-analysis, although you didn't receive  
18 any funding for your participation in that, the other authors,  
19 the study was funded by Chrysler, Ford and General Motors,  
20 correct?

21 A. That's correct. I neither asked for, nor received any  
22 funds for my work from anyone.

23 Q. But since the time of that paper, you've testified in 15  
24 trials on behalf of companies that made, sold or incorporated  
25 asbestos brakes or clutches, correct?

1 A. Yes.

2 Q. In fact, you've pretty much given the same testimony that  
3 you gave here, you've given in those 15 trials?

4 A. I should hope so.

5 Q. Okay.

6 A. It's based on the same scientific evidence that shows no  
7 association. Yes.

8 Q. And in those trials, the plaintiffs also brought experts  
9 who disagreed with your conclusions, correct?

10 A. There are people who disagree with my conclusions, but I  
11 would point out they have no scientific evidence that supports  
12 their opinions.

13 Q. And respectfully they would disagree with your statement  
14 regarding the foundation for their opinions, correct?

15 A. They have yet to show any epidemiologic study that's ever  
16 shown an association between motor vehicle mechanics and risks  
17 of mesothelioma.

18 Q. Now in trial, in depositions, you've been retained in  
19 asbestos cases by brake suppliers like Abex, Honeywell and  
20 Carlisle?

21 A. Yes.

22 Q. Car companies Ford, General Motors, Chrysler, Toyota,  
23 Honda, Mercedes, Volvo, Nissan, BMW and Volkswagen?

24 A. Yes.

25 Q. Truck and heavy equipment manufacturers like Caterpillar,

1 Mack Truck and John Deere?

2 A. Yes.

3 Q. And brake suppliers like NAPA, the National Auto Parts  
4 Association, Auto Zone and Pepboys, correct?

5 A. Yes.

6 Q. Now, your compensation with regard to your litigation, is  
7 that you spend about 20 to 25 hours per week on litigation  
8 issues, correct?

9 A. I think that's a reasonable estimate.

10 Q. And over the last five years, about 50 to 70 percent of  
11 your income has been derived from litigation activities,  
12 correct?

13 A. It varies year by year. In some years that would be  
14 accurate, yes.

15 Q. Since you're billing rate is about \$625 an hour, that  
16 would result to around 15 -- 12- to \$15,000 per week in income  
17 from litigation activities, correct?

18 A. Let me just do the math. Yes.

19 Q. Now you've testified in the past, you estimated that your  
20 income from 1986 through 2005 from litigation activities was  
21 somewhere between 3- and \$4 million. You recall that,  
22 correct?

23 A. I don't believe I ever testified to that. Do you have a  
24 transcript?

25 Q. Sure.

1 MR. GEORGE: Your Honor, may I approach?

2 THE COURT: Yes.

3 BY MR. GEORGE:

4 Q. I want to turn your attention to some testimony from a  
5 case in California entitled Merle Sandy verse Asbestos  
6 Defendants, from December 6 of 2005. Do you remember  
7 participating in those proceedings?

8 A. Yes.

9 Q. That was a trial, correct?

10 A. Yes.

11 Q. You were before a jury?

12 A. I believe it was.

13 Q. And Mr. Chris Andresa, I believe, was the plaintiff's  
14 counsel in that case? Do you recall that?

15 A. Yes, I do.

16 Q. And on page 53, starting with line 2.

17 "Just so we can fix this then, 1986 was the first legal  
18 case; is that right?

19 A. To the best of my recollection I believe it  
20 was.

21 Q. Okay. Then that would be about 19 years ago,  
22 correct?

23 Then, roughly, because this was about 2005, correct?

24 A. Yes.

25 Q. So we're talking about the time from when you began in

1 1986 to the present, which is 2005.

2 Q. How much have you made over the years as a  
3 legal consultant, Doctor?

4 A. I don't know.

5 Q. Can you ballpark it for us?

6 A. Not with any accuracy, no, I would have to  
7 speculate.

8 Q. Would it be north of \$1 million?

9 A. Yes.

10 Q. Would it be north of \$2 million?

11 A. Yes.

12 Q. North of \$3 million?

13 A. Probably.

14 Q. North of \$4 million?

15 A. Could be.

16 Q. In excess of \$5 million?

17 A. I don't know.

18 Q. That's what you testified at that time, correct?

19 A. And I made clear I would have to speculate. I don't know  
20 what those numbers are, taken incrementally up by 1 million,  
21 2 million, 3 million, I gave my best estimates of what I was  
22 frankly guessing at. More than two; yes. More than three;  
23 probably, I don't know. That's what I really answered.

24 Q. Well, you can't give us a specific dollar amount. You  
25 agreed before a jury that from 1986 to 2005 it was likely that

1 you made more than 3 million, and could be as high as  
2 4 million, correct?

3 A. The testimony stands for itself. I would have to  
4 speculate. I made that clear. As to what the numbers were,  
5 you got the answers.

6 Q. Okay. Now that was as of 2005. Since that time, 2006,  
7 you made about \$300,000, correct?

8 A. I think that's a reasonable estimate.

9 Q. 2007, between 3- and 400,000?

10 A. I think that's a reasonable estimate, yes.

11 Q. 2008, 450,000?

12 A. That's seems a little more precise than I probably  
13 remembered. But if you put 100,000 plus or minus around that,  
14 it's probably accurate.

15 Q. If you testified to that in the Millwork case, you  
16 wouldn't disagree with that, would you?

17 A. My testimony in every case has been to the best of my  
18 recollection. If I said it, I'll stand by it.

19 Q. And the best of your recollection, year 2009 was between  
20 200,000 and 300,000, correct?

21 A. I think your chart says 200,000, and 300,000, yes.

22 Q. 2010, 500- to 600,000, correct?

23 A. If that's what I testified to, I will stand by it.

24 Q. 2011, you told me in the deposition you did in this case,  
25 that you were doing between 600- and 900,000 for the last two

1 years, correct?

2 A. Yes.

3 Q. So that would be a total between 5.95 million to  
4 7.85 million, if that math is correct, correct?

5 A. Well, remember half of what you're totaling there is  
6 based on the testimony and Merle Sandy where I said I would be  
7 speculating. Okay. So those are not accurate numbers. So  
8 about half of that you would have to say well, that's open to  
9 question.

10 Q. Well, the last seven years --

11 A. Having --

12 Q. You've made --

13 A. If I might finish.

14 Q. For the last seven years --

15 A. Sir, may I finish my answer?

16 Q. I didn't know you weren't. Excuse me.

17 A. Okay. Okay. So you're adding up numbers that I made  
18 clear half of it is based on a speculative estimate that  
19 covered almost a 20-year period.

20 Q. In that 20-year period your speculative estimate was  
21 between 3- and \$4 million, correct?

22 A. No, it was exactly what I said it was. We just read it  
23 into the record.

24 Q. In the last seven years, you've made between 2.95,  
25 2.95 million to 3.58 million, correct?

1 A. I think that is a reasonable estimate of the past seven  
2 years, yes.

3 Q. Okay. Now that doesn't include the billing for 2013,  
4 correct? We were just up to 2012?

5 A. That's correct.

6 Q. Now in 2013, just in this case, you, your company, has  
7 sent to the debtors in this case, Garlock, invoices in the  
8 amount of almost \$140,000, correct?

9 A. Without looking at the invoices, I don't recall. But if  
10 you have pulled that from my invoices and those are the  
11 numbers, yes.

12 Q. Now that's not your total billing in this case. Because  
13 your total billing in this case from the time you were  
14 retained is \$208,000, if those in fact reflect the invoices  
15 that we received?

16 A. Yes.

17 Q. Okay. Now in that, 42 hours of your time was spent  
18 talking to Mr. Harris, Mr. Schachter or somebody in the law  
19 firm, correct?

20 A. Again, I don't recall. But if that's taken from my  
21 bills, I will agree it is correct.

22 Q. So about \$26,000 of your bills in this case was you  
23 discussing your opinions with these attorneys, correct?

24 A. No.

25 Q. Let me ask you this, for all that money, was there

1 anything that you told this judge today that is substantially  
2 different than what you've told juries over the last 15 times  
3 that you've been in court and in asbestos case involving  
4 friction product exposure?

5 A. I don't believe so.

6 Q. Now, you would agree with me that epidemiology is not the  
7 study of the cause of disease in people, correct? It's the  
8 study of the cause of disease in populations of people; is  
9 that accurate?

10 A. I'm not sure I understand your distinction there.  
11 Epidemiology is the study of the patterns of disease and  
12 patterns of exposure in populations of people. It is a  
13 foundational science to determine whether there are causal  
14 associations, which is essential if you're trying to make  
15 decisions about whether any individual person's disease was  
16 caused by an exposure.

17 Q. But epidemiology is not the study of an individual, it's  
18 a study of populations, corrects?

19 A. It always involves groups of people.

20 Q. In formulating your opinions about epidemiology and  
21 exposure to gaskets in this case, you did not incorporate the  
22 results of any in vitro or test tube experiments, correct,  
23 because that's not your field of expertise?

24 A. Again, I don't understand the thrust of your question.  
25 I'm not a toxicologist. I do not hold out that I have

1 expertise in toxicology or test tube experiments. So I rely  
2 on the epidemiology, which is the evidence from living human  
3 beings.

4 Q. You understand there's a whole body of science, there's  
5 literally hundreds, if not thousands of articles that have  
6 been published on the in vitro effects of the different types  
7 of asbestos on human and animal cells, correct?

8 A. I am aware that there is a literature on in vitro  
9 experiments that involved asbestos.

10 Q. There's also a whole world of literature with regard to  
11 animal experiments that have been done exposing them to the  
12 different types of asbestos out there and recording the  
13 results, correct?

14 A. There is indeed, although I don't know why you would rely  
15 on animal experiments when you have human evidence that is  
16 directly relevant to the questions at issue.

17 Q. Well, when organizations like the International Agency of  
18 Research on Cancer, when they answer the hypotheses, does a  
19 particular chemical cause a reaction? They look at in vitro  
20 experiments. They look at animal experiments. They look at  
21 epidemiology. They look at the totality of the evidence  
22 before they make a causal link, correct?

23 A. Yes. And with rare exception they will not decide that a  
24 chemical causes cancer in humans without sufficient human  
25 evidence, which means epidemiology.

1 Q. Now you talked about case reports. You're familiar with  
2 Harvey Checkoway, Neil Pearce, and David Kriebel's book  
3 entitled, *Research Methods for Occupational Epidemiology*?

4 A. Yes.

5 Q. Very well respected authors?

6 A. I know Harvey Checkoway and Neil Pearce for years. I  
7 know them personally, and think very highly of them.

8 Q. And this textbook is well used in universities where  
9 they're studying about epidemiology, particularly occupational  
10 epidemiology?

11 A. I don't know how widely it is used.

12 Q. In there they talk about case reports, and they say that  
13 certain conditions known as sentinel health events are so  
14 closely associated with occupational exposures, that the  
15 occurrence of any cases serves as an indication of an  
16 occupational hazard. And one of the examples they give is  
17 malignant mesothelioma, which they say is nearly always  
18 attributable to asbestos exposure. Do you agree with that?

19 A. Well, first off malignant mesothelioma is not nearly  
20 always attributable to asbestos exposure.

21 As we have seen, probably 80 to 90 percent of malignant  
22 mesotheliomas are attributable to asbestos exposure. There  
23 are some changing things in the literature.

24 For example, we now have quite adequate evidence to say  
25 that ionization radiation, therapeutic radiation,

1 specifically, causes malignant mesothelioma. I would say that  
2 was not known when Dr. Checkoway wrote his book.

3 Having said that, mesothelioma is strongly associated  
4 with exposure to amphibole forms of asbestos, yes.

5 Q. Now, ionizing radiation is a cause of mesothelioma in  
6 individual cases pretty easy to rule out if the patient has no  
7 history of therapeutic radiation, correct?

8 A. I would agree with that.

9 Q. If we looked at the world literature on how many cases  
10 that have been reported of ionizing therapeutic radiation  
11 causing mesothelioma, it would be a handful of cases, correct?

12 A. I don't know that that would be an accurate  
13 characterization. We would have to pull those studies out.

14 Q. If we looked at the world literature on how many cases of  
15 mesothelioma have been associated with exposures to asbestos,  
16 it would be literally tens of thousands, correct?

17 A. Yes.

18 Q. Okay. Now, you put up the case report that Dr. Langer  
19 did, mesothelioma in a brake repair worker, where they  
20 described a diffuse pleural mesothelioma in a man whose  
21 exposure to asbestos, was to the chrysotile form during brake  
22 maintenance and repair. That's what Dr. Langer reported,  
23 correct?

24 A. In 1982, yes.

25 Q. And in fact, they went back and they said this man for

1 many years worked in used car, tire and car repair businesses,  
2 since the age of 19. He had serviced automobiles, including  
3 the replacement of brake linings. They went back, and they  
4 said he had no history of construction or shipyard work or any  
5 other occupational contact with asbestos, and he never lived  
6 near any asbestos-fabricating plant. That's what they wrote,  
7 correct?

8 A. Yes. You have a case report, sir, a single case report.

9 Q. And a case report like this, the authors have the ability  
10 to spend the time to investigate the full circumstances of the  
11 plaintiff's exposure to the offending substance and look at  
12 the results, correct?

13 A. That is what this case report says they did. And I would  
14 point out that when that almost identical activity is taken  
15 out in a well-designed scientific study such as Rake and Peto  
16 did, they could find no association with work involving motor  
17 vehicle repair or brakes or gaskets.

18 Q. Now the difference between an epidemiologic study and a  
19 case report is that in a lot of epidemiologic studies, the  
20 authors either don't have the time, don't have the resources  
21 or don't have the ability to fully investigate the  
22 individual's total occupational history. Would you agree with  
23 that?

24 A. No, that's nonsense. That doesn't reflect an  
25 understanding of how epidemiology is conducted.

1 Q. What they did in this case, which they didn't do in Rake  
2 and Peto, is they actually got a piece of the man's tissue,  
3 and they put it under the microscope to see, hey, is there any  
4 evidence of his exposure inside his body. And what they found  
5 is, only chrysotile asbestos, no amphiboles were found, and  
6 they found asbestos fibers that were longer than we would  
7 expect to find in the ambient air so that they were probably  
8 occupational in nature. That's what they reported, correct?

9 A. That -- they said what you have put up there. The point  
10 is, you still have a case report. And what you cannot say  
11 from a case report, is whether there is any association or  
12 whether there's any statistical significance to the  
13 coincidence of a mesothelioma occurring in someone who did  
14 brake repair.

15 Q. Now we have a little bit more than coincidence in this  
16 case. We have a man whose only exposure to asbestos was to  
17 brakes. Where we've looked inside his body, and the only type  
18 of asbestos he has in his body is chrysotile, correct?

19 A. Well that's what these authors claim.

20 Q. And it's your position that this is an idiopathic  
21 mesothelioma that you don't know what the cause of this  
22 gentleman's mesothelioma is, correct, based on epidemiology?

23 A. It is my position that you cannot calculate a measure of  
24 association from this, and you cannot evaluate the role of  
25 chance. You have a single case report.

1 Q. Now there's about 165 of these single case reports in the  
2 literature, where authors have concluded that individuals have  
3 gotten mesothelioma from exposure to friction products,  
4 correct?

5 A. No. I think you've mischaracterized the literature on  
6 that point.

7 Q. Do you recall Dr. Lemen's paper, correct?

8 A. I do. And there's nothing in most of the papers that  
9 Dr. Lemen cites to where the authors claimed those cases were  
10 caused by brake work. He's pulled the cases from various case  
11 controlled studies that found no association.

12 Q. What I'm referring to, and you're familiar with this.  
13 It's called *Asbestos in Brakes Exposure and the Risk of*  
14 *Disease* from the American Journal of Industrial Medicine in  
15 2004. The author is Richard A. Lemen. He has a Ph.D and an  
16 MSPH, correct?

17 A. If you're going to ask me about this, may I have a copy  
18 to look at?

19 Q. Yes.

20 THE COURT: Why don't we take about a 10-minute  
21 break here.

22 MR. GEORGE: That will be fine.

23 THE COURT: Let's come back at 25 after 11.

24 (A brief recess was taken in the proceedings.)

25 MR. GEORGE: Your Honor, may I approach?

1 THE COURT: Yes.

2 MR. GEORGE: (Handing paper writing to the witness.)

3 THE COURT: Proceed.

4 BY MR. GEORGE:

5 Q. When we broke, Dr. Garabrant, we were talking about Dr.  
6 Lemen's paper, *Asbestos in Brakes Exposure and Risk of*  
7 *Disease*. Now unlike you, Dr. Lemen has his Ph.D in  
8 epidemiology, correct?

9 A. I'm not sure what it's in. I don't know. I think my  
10 mike is off.

11 THE COURT: Can we turn his microphone on?

12 THE WITNESS: How is that?

13 THE COURT: Okay. Good.

14 BY MR. GEORGE:

15 Q. You do know that Dr. Lemen is a retired Assistant Surgeon  
16 General of the United States Public Health Service and the  
17 retired Deputy Director and acting Director of NIOSH, correct?

18 A. Yes. That's what his paper says.

19 Q. Now, when he investigated the literature regarding brakes  
20 and asbestos, he said that a review of the published  
21 peer-reviewed literature reveals at least 165 cases of  
22 mesothelioma in end product users of friction products.  
23 That's what he reported, correct?

24 A. That's one of the things he reported. He also made note  
25 that the epidemiology has been equivocal. If you go to page

1 233 I can show it to you.

2 Q. Now, if we went to the citations that he list there, it  
3 would show us in each one of those publications, their listing  
4 individuals who were exposed to brakes who got mesothelioma,  
5 correct?

6 A. Yes. Many of those publications are going to -- leave it  
7 up, please -- are the same ones that I have just shown. Sir.

8 Q. And many are not?

9 A. He lists the McDonald study. He lists the Woitowitz and  
10 Rodelsperger study, Teschke, Agudo, Milham and Osiander, all  
11 of which are studies that showed no association whatsoever  
12 between mesothelioma risk, and work as a brake mechanic. To  
13 mischaracterize those studies as supporting that there is an  
14 association is inappropriate.

15 Q. And respectfully, there are a lot of publications there  
16 that you didn't talk about where the authors found one, two,  
17 three, four, seven, or more cases of mesothelioma in  
18 individuals whose sole occupation was friction product work,  
19 correct?

20 A. No. Dr. Lemen relies on case reports. All of the other  
21 studies that are listed on that page 234, are case reports.  
22 Some of those case reports are wrong.

23 For example, he cites to the Australian Mesothelioma  
24 Registry, in which the principal investigator of that registry  
25 published a paper attributing cases of mesothelioma to brake

1 work, and said there was no other exposure. Under oath in a  
2 deposition he recanted and said that a substantial proportion  
3 of those cases actually did have other exposure.

4 So to characterize those case reports as evidence that  
5 brake work causes mesothelioma is not correct.

6 Q. Now you talked about how -- let me ask you this. There's  
7 a difference between brakes and gaskets, correct?

8 A. Well, to the extent I'm familiar with brakes and gaskets,  
9 yes. Brakes are used to stop a car, gaskets are used to  
10 provide a seal between two metal surfaces.

11 Q. And more importantly, when we talk about exposure, when  
12 we talk about brakes, the application of the brake, the  
13 pressure and the heat of applying the brake means that when  
14 the mechanic is taking compressed air to blow out that brake  
15 wear debris, less than 2/10ths of a percent of that dust is  
16 actually still asbestos, correct?

17 A. Sir, I have been in depositions a number of times in  
18 brake cases where the plaintiffs have claimed that they file  
19 and grind and arc grind brakes. That testimony I believe, is  
20 meant to establish that they have exposure to the chrysotile  
21 asbestos that has not been subjected to wear or degradation by  
22 temperature into forsterite.

23 In that sense, exposure to brakes and exposure to gaskets  
24 has some similarity, both are bonded asbestos products  
25 containing chrysotile. It is difficult to get substantial

1 amounts of chrysotile asbestos out of those products, unless  
2 you do something to machine them.

3 Q. Respectfully getting back to my question, you've been in  
4 depositions, you've read depositions of brake mechanics where  
5 their only exposure to asbestos is from blowing out the used  
6 brake dust in the wheel well, correct?

7 A. I have read depositions where plaintiffs claim their only  
8 exposure to asbestos was from brakes. I don't recall any  
9 where a brake mechanic said his only exposure from brakes was  
10 from blowing out the dust on the brake assembly.

11 They typically talk about opening the boxes, handling the  
12 brakes, arc grinding, hand grinding, sanding and filing the  
13 edges of the brakes, as well as cleaning up the brake  
14 assembly, either with a rag or a solvent or compressed air.

15 Q. So it's your testimony that one of the routine procedures  
16 that a brake mechanic would do is to grind brakes?

17 A. I don't actually believe that that is true, routinely.  
18 Modern brakes, to the extent I am aware of it, are made to fit  
19 the brake assembly without machining.

20 I will agree that historically going back to the 1950s,  
21 brakes were not necessarily made to fit and might have  
22 required manipulation. But modern brakes, as far as I'm aware  
23 typically do not.

24 Q. So mechanics that did this work in the '60s, the '70s,  
25 the '80s, the '90s, their only exposure to asbestos is from

1 what little chrysotile remains from the blow out of the brake  
2 wear debris, correct?

3 A. Well that's not the testimony of the plaintiffs, no.

4 Q. But that's what you believe, correct?

5 A. No. That's not what I said.

6 Q. You just told me that it was your understanding that you  
7 didn't have to grind brakes after the 1950s.

8 A. That's not what I said. I said, I'm aware that in the  
9 '50s sometimes you did have to machine them, they weren't  
10 custom made.

11 I didn't say after that -- first off, I didn't say that  
12 you always had to grind them in the '50s, nor did I say you  
13 never have to grind them after the 1950s.

14 I'm not a brake mechanic. I've done my own brake  
15 repairs. I used to do my own car service when I was in high  
16 school.

17 I can't say that I know all of the practices of brake  
18 repair, but it is my impression things have resolved --  
19 evolved -- evolved over time, and that brakes in the past 20,  
20 30 years, typically fit the assembly properly without  
21 machining.

22 Q. And that would have an effect, would it not, on the total  
23 dose of exposure that a mechanic had? If a mechanic ground  
24 the brakes as well as blew out asbestos, he would more likely  
25 than not have more exposure than a mechanic whose only

1 exposure to asbestos in his career is blowing out the wear  
2 debris that only contains .2 percent chrysotile asbestos,  
3 correct?

4 A. I would agree that if a mechanic grinds or sands or arc  
5 grinds a brake, that that would generate additional exposure  
6 in addition to blowing out the brake assembly with compressed  
7 air.

8 Q. That would be something important we would have to know  
9 in epidemiological study, when we're looking at cases versus  
10 controls, to be important to know how many of these  
11 individuals were exposed to asbestos from grinding, in  
12 addition to just blowing out wear debris, and those that just  
13 had the exposure to the .2 percent chrysotile generated from  
14 the blow out of wear debris, correct?

15 A. The studies that we have reviewed, the epidemiology  
16 studies and the analysis I've presented, involve people who  
17 were doing brake repairs in the '40s, '50s, '60s and '70s.  
18 They were doing whatever brake repair routinely involved in  
19 that historic details.

20 Q. But there's no details in any of these epidemiological  
21 studies that will tell us how many of those mechanics were  
22 doing blow out, and how many of those mechanics were doing  
23 both grinding and blow out, correct?

24 A. Many of those studies collected detailed exposure  
25 information with descriptions of every job and the tasks

1 performed.

2 The published versions of the papers, which are typically  
3 limited to six to nine pages, do not contain those details.  
4 But if you read the methods as we read in the Rake and Peto  
5 article, they asked in detail about exposure to brakes. They  
6 asked about the tasks people performed.

7 And if you go through the methods of many of the case  
8 controlled studies, they did ask specific details about how  
9 the asbestos was used and what tasks were performed with it.

10 Q. You would agree with me that a gasket that's in a pipe  
11 flange, is not subject to this process of forsterization  
12 (phonetic), correct?

13 A. To the extent I am aware of it, I would think it is not.

14 Q. Now, you talked about the connection between mesothelioma  
15 and asbestos exposure. You would agree that there's two main  
16 factors that affect the ability of anybody to make the  
17 attribution, and that would be latency and life expectancy.  
18 Do you agree with that?

19 A. I'm not sure I understand your question adequately.  
20 Could you restate it?

21 Q. Sure. If I'm trying to find out if a certain individual  
22 like Mr. Harris had exposure to asbestos, I find out he has  
23 mesothelioma. If he's dead, which life expectancy for  
24 somebody with mesothelioma is about 16 months. If I don't  
25 start my study in time and he's deceased, I have to rely on

1 secondary sources to find out if he's been exposed to  
2 asbestos. I have to talk to his wife. I have to talk to his  
3 kids. Sometimes I have to talk to his neighbors, correct?

4 A. Typically you talk to next of kin for a deceased subject  
5 in a case controlled study. The first next of kin would be  
6 the wife.

7 Q. And you would agree that there's certain instances  
8 because of the long latency, i.e., exposure that I had 30, 40  
9 or 50 years ago is what's causing my disease now because of  
10 that lag time, it's difficult sometimes for spouses to know  
11 what their husband did in their teen years or in their 20s  
12 correct?

13 A. Yes. It is difficult to know, and epidemiologists go to  
14 great lengths to try to control for that problem.

15 When you do a case control study, if your case is dead  
16 and you have to interview a surrogate, you do the same for the  
17 control, when the control is living or dead.

18 So in other words, if a dead case, you interview the  
19 wife. If you have a control who is matched to that case, you  
20 interview the wife to ensure that you have comparable  
21 information for both the case and the control.

22 Q. And that's not always happened. For example, in the  
23 Agudo study, which is one of the studies you referred to, they  
24 only interviewed 33 percent of the cases, but they interviewed  
25 80 percent of the controls, correct?

1 A. Well let's get the study out and look exactly at what  
2 they did.

3 Q. Never mind. I'll move on.

4 Let me ask you this, would you agree that just because we  
5 can't identify a history of exposure to asbestos in a  
6 particular individual, doesn't mean that that mesothelioma was  
7 not caused by exposure to asbestos?

8 A. Well, if you cannot identify a history of exposure to an  
9 agent, you're left speculating as to whether there was or was  
10 not exposure.

11 Q. Well, we can't conclude that it definitely was not due to  
12 asbestos unless we exhaust all information sources to see if  
13 in fact that individual was exposed to asbestos during his  
14 lifetime, correct?

15 A. I think it's fair to say that if you do a detailed  
16 interview and cannot uncover any information indicating a  
17 past exposure to asbestos, you have no evidence of exposure.  
18 You can speculate it could have been there. But the answer  
19 is, you don't have data that supports your speculation.

20 Q. But out of those 10 or 20 percent of cases that are  
21 reported in the literature of being idiopathic, where they  
22 don't know their cause, there are certainly individuals there  
23 that died before anybody can could get a detailed occupational  
24 history from them, correct?

25 A. There certainly may well be, yes.

1 Q. Let's talk a little bit about brake work epidemiology  
2 that you talked about.

3 In your meta-analysis you put auto mechanics down there  
4 by teachers, office clerical, and non-asbestos miners,  
5 correct?

6 A. Yes.

7 Q. Now would you agree with me that if an auto mechanic  
8 didn't do brake work for his career and wasn't exposed to  
9 asbestos, then they wouldn't necessarily have the same level  
10 of exposure as a teacher or an office clerical person?

11 A. Well, first off, auto mechanics I believe do repairs on  
12 the mechanical systems of cars. That routinely involves  
13 brakes, clutches and gaskets.

14 Q. But you're not here to say that all auto service involves  
15 exposure to asbestos, are you?

16 A. I'm not. If you replace a taillight, I would think that  
17 doesn't involve asbestos exposure. But if you're doing  
18 brakes, clutches and gaskets, you are handling -- or  
19 historically you're handling asbestos-containing parts.

20 Q. There's plenty of workers in the work force who are motor  
21 mechanics or auto mechanics, who did nothing with regard to  
22 brakes; the did alignments, they did muffler repairs, they did  
23 electrical repairs, the did tune ups, the did air conditioning  
24 repair, they did tire service, they did battery repair, they  
25 did oil changes, the did windshield repair, they were

1 transmission specialists or they did radiators, correct?

2 A. When you look at the epidemiology studies, they put motor  
3 vehicle mechanics together. I would agree not all motor  
4 vehicle mechanics do brakes, clutches and gaskets.

5 However, in my experience, I've never known a mechanic  
6 who didn't have some experience doing brakes, clutches and  
7 gaskets.

8 Q. How many?

9 A. Because at times they do them, even though later in his  
10 career a mechanic might specialize and do just transmissions  
11 or might specialize and do just fuel injectors. Most  
12 mechanics have actually done a wide range of repairs.

13 But I'm not an expert in what mechanics do, that's my  
14 personal experience.

15 Q. Out of the 5 million workers in the automotive field, how  
16 many mechanics have you actually had personal experience with?

17 A. I don't know, probably a dozen or so.

18 Q. Now, in your study, your meta-analysis, this is the one  
19 that was sponsored by Ford, Daimler-Chrysler and General  
20 Motors. In your chart, you actually looked at the 11 studies  
21 that you did the meta-analysis on to try and determine how  
22 many of those studies were they actually specific to somebody  
23 who did brakes, correct?

24 A. Yes, we did. And we gave the study a point if they  
25 specifically addressed brake repairs versus simply being a car

1 mechanic. Because a study that specifically addressed brake  
2 repairs, I think had better information that the person really  
3 was exposed to chrysotile from brakes.

4 Q. And out of your 11 studies, only three of them were  
5 specific to the type of activity that would generate asbestos  
6 exposure, correct?

7 A. No. They were all about vehicle mechanics, some of them  
8 asked and reported specifically that the brake mechanics --  
9 that the auto mechanics did brake repair. These are studies  
10 of auto mechanics. These are people who do what auto  
11 mechanics do.

12 Q. But in eight of those studies, they had no idea how many  
13 of the people that they're calling motor mechanics or garage  
14 workers or automobile workers or anybody that has to do with  
15 auto servicing, actually did brake repair, correct?

16 A. I think that mischaracterizes those studies.

17 Again, what you publish in the six or seven or eight or  
18 nine pages you're allowed, does not allow you to publish  
19 detailed tables of everything you know.

20 You have to look at the methods to see what sorts of  
21 questions these authors asked, and many of them took detailed  
22 histories, and had very detailed information about the tasks  
23 that people did that involved asbestos. They didn't report  
24 out that people said they did brakes or gaskets or windshields  
25 or taillights or timing repairs. They said they were vehicle

1 mechanics.

2 Q. Your group of experts that are writing this report on a  
3 meta-analysis to try and find out if motor vehicle mechanics  
4 have a risk of mesothelioma, you went through all these 11  
5 studies pretty carefully to see if you could answer the  
6 question, because it was part of your matrix here, of whether  
7 the authors disclosed any information in their studies,  
8 whether they were talking specifically about brakes, or  
9 whether they were talking generally about mechanics, correct?

10 A. No. That mischaracterizes what we did. We went through  
11 to determine whether the papers reported odds ratios or  
12 relative risks related to brake repair specifically. It  
13 wasn't whether the paper contained information about brakes.  
14 It's whether they actually could calculate an odds ratio  
15 specific to brake repair.

16 Q. And so you're saying you had information about these 11  
17 studies, and more than three of them were specific to brake  
18 repair, they just didn't report those results; is that what  
19 you're telling us?

20 A. No, sir.

21 Q. Let's -- you told the court that the first epidemiologic  
22 study about brakes and mesothelioma was 1980, correct,  
23 McDonald? That's what you testified to, correct?

24 A. Yes. But that's the wrong paper you have up there.

25 Q. Right. Because this one's from 1970, 10 years earlier,

1 correct?

2 A. This one didn't report anything that I'm aware of  
3 regarding motor vehicle mechanics.

4 Q. Well, they talked about the survey they described. They  
5 wanted to get a more representative view of the problem in one  
6 of the two major chrysotile producing countries of the world.  
7 So they were looking at all fatal cases known to have occurred  
8 in Canada since 1959. When they did their evaluation, they  
9 were looking at occupations who had definite or probable  
10 exposure to asbestos, and they found that there were two that  
11 have brake lining installation, correct?

12 A. I don't know this paper. Could you give me a copy of it.

13 Q. Be happy to. I think you turn to page 96 -- sorry, to  
14 page 918, table six. Talks about the *Distribution of*  
15 *Occupations Classified Under Definite or Probable Exposure to*  
16 *Asbestos*. You see that, correct?

17 A. I don't think I've ever read this paper, sir. Could I  
18 take time to read it I don't know the paper I apologize.

19 Q. Well, let me go quickly just to the conclusion, then I'll  
20 be happy to let you read what you need to read.

21 A. Sir, if you're going to ask me about a paper, I would  
22 like to read it.

23 THE COURT: Let's go on to something else. If he  
24 hasn't read the paper, I don't think he would have an opinion  
25 about it.

1 BY MR. GEORGE:

2 Q. So if in fact Dr. McDonald reported on an increased risk  
3 in brake lining workers in 1970, that's not something that  
4 you're familiar with, correct?

5 A. Sir, to characterize that that paper reports something  
6 without establishing whether there's any odds ratio, is not a  
7 fair question. If we're going to ask about what the  
8 conclusions in the paper are, I would like to read it.

9 Q. I'll save that for the next time when you're in court  
10 when you've had an opportunity to review it.

11 Now there's also a paper from 1978, which I think you're  
12 familiar with, it's called *Non-occupational Exposure to*  
13 *Asbestos and Malignant Mesothelioma in Females* by Vianna and  
14 Polan. That's a study you have seen, correct?

15 A. Just a moment.

16 Q. If you haven't, I'll give you a copy.

17 May I approach?

18 THE COURT: Yes.

19 MR. GEORGE: (Handing paper writing to the witness.)

20 Q. This is a paper that we discussed in the *Daubert* hearing  
21 in Ohio a couple years ago.

22 A. Could I just take a minute to look at it?

23 Q. Is this a paper you've seen before?

24 A. To be honest, I'm trying to recall. I don't know that I  
25 have.

1 Q. The extent of this paper talks about the fact that there  
2 are wives of husbands who worked in brake lining repair that  
3 got mesothelioma. That's not something that you took into  
4 consideration in formulating your opinions, correct?

5 A. I have seen this paper. It's been a while. I have seen  
6 it. It is --

7 Q. So this is from the *Lancet* in 1978, correct?

8 A. May I just take a minute to familiarize myself with it  
9 again?

10 (Pause.)

11 THE WITNESS: Okay. Go ahead.

12 Q. Do you understand this was 1978, correct?

13 A. Yes.

14 Q. So this was two years before the 1980 paper that you  
15 referenced in your Direct, correct?

16 A. Yes.

17 Q. Now this paper they were investigating -- they had 52  
18 females, and they were trying to see if, according to the  
19 paper, a study of the occupational history of 52 females with  
20 malignant mesothelioma, and certain of their relatives, was  
21 carried out to measure the risk of this disorder attributable  
22 to indirect asbestos exposure, showed that a significantly  
23 greater number of husbands and father of cases than of  
24 controls, worked in asbestos-related industries, and the  
25 relative risk was a factor of 10.

1 Now on page 1062, they give us a table of 15 of those 52  
2 patients correct?

3 A. Yes.

4 Q. And they list there what the patient did, what the  
5 husband did, what the father did, and whether they resided in  
6 an area where there was some type of business that would be  
7 generating asbestos dust, correct?

8 A. Well, they report what they report. And the principal  
9 observation -- before you change it -- if you might, please,  
10 go back.

11 Q. Well --

12 A. Thank you.

13 Q. I understand that there's some heat insulation workers,  
14 but that's not what I'm asking about. I'm asking about the  
15 brake guys.

16 A. Well, sir, you asked me a question and then you changed  
17 the slide before I could answer. Please go back.

18 Q. Well, I'll ask you the specific question that I asked  
19 you.

20 A. No, sir.

21 Q. Isn't it true, respectfully --

22 MR. SCHACHTER: Your Honor, could the witness be  
23 permitted to respond to the question he was asked based on  
24 what was presented?

25 THE COURT: If you want to answer that question, you

1 have to let him go back and let him see it. If you don't want  
2 to answer that question, go on.

3 MR. GEORGE: I'm going to go on. I'm going to  
4 rephrase it.

5 Q. Isn't it true, specifically, that the authors listed the  
6 occupational history of the patient, the husband, and whether  
7 there was residential asbestos exposure; is that true?

8 A. Yes.

9 Q. Okay. And among the exposures, they had two patients,  
10 both with pleural mesothelioma who had a husband that was a  
11 brake lining worker, correct?

12 A. Yes.

13 Q. And they said of those 10 patients, 10 of the patients of  
14 the 15 had husbands and/or fathers who worked in  
15 asbestos-related occupations whereas their matched controls  
16 did not. This is your case controlled study, correct?

17 A. It is a case controlled study, that is correct.

18 Q. And they said all of these 10 patients routinely hand  
19 laundered their husbands or father's clothing, correct?

20 A. Yes.

21 Q. And they said the estimated relative risk of mesothelioma  
22 for this pattern of exposure, which is laundering the clothing  
23 of husbands and fathers, some of which were brake lining  
24 workers, gave relative a risk of 10, with a 95 percent  
25 confidence interval of 1.42 to 37.40. That would be a

1 significant, statistically significant increased risk of  
2 mesothelioma, correct?

3 A. That is a significant association, but it is important to  
4 look at what they're actually analyzing. They're analyzing  
5 the occupations of the husbands, all of which were presented  
6 in that first table that you took down quickly.

7 And there -- the risks are more likely to be related to  
8 the husband having worked in insulation, which some of them  
9 did, and with electrical wire insulation as electricians or  
10 elevator insulation, all of which is in that table.

11 So what you've characterized as a 10-fold risk, relates  
12 to the comparison of all of the cases whose husbands were --  
13 many of whom worked in settings where there was likely to be  
14 thermal insulation.

15 Those authors presented no analysis that showed any  
16 relationship between husbands working with brake linings and  
17 risk of mesothelioma. There is none.

18 I would also point out that that paper says nothing about  
19 having been a brake mechanic. You cannot tell from this paper  
20 whether these people worked in brake product manufacturing, or  
21 whether they were auto mechanics, because the paper doesn't  
22 say.

23 The important point is, there is no measure of  
24 association in this paper that says anything about risk of  
25 mesothelioma related to brake linings.

1 Q. And what the authors didn't do is have the interpretation  
2 that you're trying to foster right now. They didn't say, this  
3 relative risk applies to eight of the 10 patients, but not to  
4 the two whose husbands only had brake lining repairs, correct?  
5 They didn't say that in the paper?

6 A. Sir, it says exactly -- if you'll please hold back on the  
7 quote you were asking me about until I get the answer.

8 It reports the relative risk of mesothelioma for that  
9 pattern of exposure, putting all of the cases and controls  
10 together. That is not the relative risk for brake lining  
11 work. That's the relative risk for all of the data.

12 And what you have actually just pointed out is a very  
13 good example of confounding.

14 Q. Twenty percent --

15 A. Okay. So what we have is an association between asbestos  
16 exposure, much of which involved thermal insulation, and risk  
17 of mesothelioma, where you're trying to say it's attributable  
18 to brake lining without controlling for the other exposure.

19 Q. Now we have cases in here where the plaintiff was a  
20 textile worker. There's one, two, three, four of them are  
21 textile workers. Those are not insulation exposures. Those  
22 are insulation exposures to chrysotile asbestos, correct?

23 A. Sir, you brought this up as an example of a case where  
24 women whose husbands worked with asbestos were at risk of  
25 mesothelioma. The point of the paper is the husband's

1 occupational history.

2 And please stop moving the slides ahead before I can  
3 answer your question.

4 Can we go back to the table, sir?

5 Q. (Indicating.)

6 A. Thank you. The husbands worked as pipefitters, heat  
7 insulation workers, heat electric wire worker, heat insulation  
8 worker, heat insulation worker, elevator insulation worker,  
9 electric wire insulation worker. Okay. That's the point of  
10 the paper. All of that is grouped together.

11 Q. Twenty percent of that exposure, two out of the 10 there  
12 that had husbands that they were referring to had brake lining  
13 exposure, correct?

14 A. Well, I think if you'll go back to the paper, you'll  
15 actually see that it's three, not two. And if you tried to  
16 calculate an odds ratio where you have three cases, of course  
17 they haven't told us how many of the controls had husbands who  
18 worked as brake lining workers, it is unlikely you would  
19 achieve statistical significance from such a small number.  
20 But you can't do the calculation because the authors don't  
21 present the data.

22 Q. Now you did present the case of Eva Hansen. She did a  
23 study, she did a 10-year follow-up on the mortality of auto  
24 mechanics in Scandinavia, correct?

25 A. Yes.

1 Q. And for specific cancer sites, she saw increases for  
2 pleural mesothelioma. That's what she reported, correct?

3 A. Could you show me the paper, please?

4 Q. This was a paper on your chart, not the first time you  
5 have seen this?

6 A. I have seen this paper.

7 Q. In fact, you cited it in your direct.

8 MR. GEORGE: May I approach?

9 THE COURT: Yes.

10 THE WITNESS: Thank you.

11 BY MR. GEORGE:

12 Q. Isn't it true in the final incidence of the abstract,  
13 they said increases were seen for pleural mesothelioma,  
14 correct, among other cancers?

15 A. That is what the abstract says. But she did not  
16 calculate any measure of association.

17 Q. She said that the asbestos exposure known to occur during  
18 replacement of brake linings, and the single case of pleural  
19 mesothelioma is an indication that this exposure has not been  
20 negligible. That's what she wrote, correct?

21 A. That's what she wrote. Although there is good reason to  
22 think that that's not a valid conclusion.

23 Q. Now we go to table one on page 44. This gives us some of  
24 the age demographics of the exposed persons that she was  
25 evaluating, correct?

1 A. Yes.

2 Q. And if we look at this chart, you would agree with me  
3 that the average latency period for somebody exposed to  
4 asbestos is about 35 years?

5 A. Yes, or slightly longer.

6 Q. If we look at the people that she was looking at,  
7 92 percent of them were 50 years old or younger after the  
8 10-year follow-up?

9 A. How are you getting that?

10 Q. Well, if we look at how many were between 15 and 24 when  
11 she started in 1970 at 64 percent. Between 25 and 34 were 21  
12 percent. Between 35 and 44 were 7 percent.

13 A. Again, sir, your question said 50 or younger.

14 Q. 54 years old or older after the 10 years?

15 A. Sir.

16 Q. Ninety-two percent of this cohort was under the age of  
17 54, 10 years after they started when they did this evaluation.  
18 Is that what that chart shows us?

19 A. Sir, your previous question said 50. This gentleman's  
20 head was blocking the footnote. And I was looking and  
21 thinking, how is he getting 50? The table doesn't report 50.  
22 Your question was wrong. You have to wait until I answer,  
23 please.

24 Okay. Yes, this was a young cohort.

25 Q. And so if we went back and visited this cohort where

1 maybe more than 8 percent of them were in the age where we  
2 would expect to see mesotheliomas, we might see more  
3 mesothelioma cases than that single one, correct?

4 A. Well, as this cohort ages, and as the comparison  
5 population ages, you would expect both groups to have incident  
6 cases of mesothelioma.

7 Now, before we go on from Hansen, sir --

8 Q. I have no more questions about Hansen, respectfully.

9 Let me just talk to you about -- in your meta-analysis,  
10 your co-authors on that were scientists from Exponent,  
11 correct, some of them?

12 A. Yes.

13 Q. And Exponent is a large organization that provides  
14 litigation support for businesses. There are a lots of Ph.Ds  
15 and other qualified experts, correct?

16 A. I don't know no Exponent's business. I do have some  
17 colleagues that work at Exponent.

18 Q. Do you know Mike Kelch or Valerie Craven?

19 A. I met Dr. Kelch when he was getting his doctorate in  
20 epidemiology at UCLA in the 1980s. Yes, I know Dr. Kelch. I  
21 know he was at Exponent for years. He is no longer at  
22 Exponent. I think he now works at Amgin (phonetic).

23 Q. They were co-authors with you on your meta-analysis,  
24 correct?

25 A. Yes.

1 Q. And you're aware that they took your paper -- you're  
2 aware that in the early 2000s the EPA decided that they were  
3 going to re-evaluate a brochure that they put out entitled,  
4 *Preventing Asbestos Exposure Among Brake Clutch Repair*  
5 *Workers*. You're aware of that, correct?

6 A. Sir, what document is this that we're reading from?

7 MR. SCHACHTER: Objection, Your Honor. We're going  
8 well afield --

9 MR. GEORGE: This is a letter --

10 MR. SCHACHTER: May I raise my objection?

11 THE COURT: Yes.

12 MR. SCHACHTER: He's getting into regulatory issues  
13 of something presented to the EPA. It's well beyond the  
14 direct examination in an area where this witness has not been  
15 tendered.

16 THE COURT: Well, we'll let him inquire. Go ahead.

17 BY MR. GEORGE:

18 Q. Were you aware that Valerie Craven and Michael Kelch,  
19 your co-authors took your meta-analysis and sent it to the EPA  
20 for input on whether the EPA should report those results to  
21 the population in their EPA booklet. Are you aware of that?

22 A. No.

23 Q. Okay. Now you are aware -- have you seen the actual  
24 booklet that came out by the EPA? Have you seen, *Preventing*  
25 *Asbestos Exposure Among Brake and Clutch Repair Workers*?

1 MR. SCHACHTER: And once again, Your Honor, we have  
2 to object. Regulatory activity as we briefed to the court,  
3 regulatory materials are not supportive of causation. They're  
4 not included even in this district with the opinions that  
5 regulatory activity are not relevant to causation. We didn't  
6 go into regulatory acts with this witness.

7 THE COURT: We'll let him inquire. Go ahead.

8 BY MR. GEORGE:

9 Q. Are you familiar with this document?

10 A. I don't know it with that picture on it, I'm not sure.

11 Q. Okay.

12 A. I know I have seen something from the EPA about  
13 preventing asbestos exposure among brake and clutch repair  
14 workers, but I don't recognize the document that you put up.

15 Q. You're not aware of any governmental agency adopting the  
16 results of your meta-analysis and informing the public that  
17 they could rest assured that their exposure to brakes does not  
18 cause mesothelioma, correct?

19 A. I have not followed what all government agencies are  
20 doing, and I didn't prepare on that topic for my testimony in  
21 this case.

22 Q. You are aware that there are other scientists out there  
23 who disagree with your conclusion, based on review of the same  
24 epidemiologic studies that you reviewed, correct?

25 A. I don't believe that's correct. If you're referring to

1 Dr. Egilman's paper, I don't think he has reviewed the same  
2 studies I just presented.

3 MR. SCHACHTER: Your Honor, I have to object to  
4 the -- first of all the length of the cross examination going  
5 into articles we didn't go into. And to presenting articles  
6 without the witness having first testified whether it's  
7 reliable or not under the rules of evidence that's a  
8 prerequisite to even mentioning these articles.

9 THE COURT: We'll let him roll for a bit forward.  
10 Let's wind it up here pretty quick.

11 MR. GEORGE: I'm working through it.

12 Q. You're aware of Dr. Egilman, correct?

13 A. Yes.

14 Q. He has the same degree that you have, because he went to  
15 the same institution that you went to and got his Master's of  
16 public health, correct?

17 A. I believe Dr. Egilman got his MPH at Harvard, yes.

18 Q. And his conclusion, in fact, he titled his article, *Abuse*  
19 *of Epidemiology Automobile Manufacturers Manufacture a Defense*  
20 *to Asbestos Liability*. You've read this before, correct?

21 A. Yes, I have.

22 Q. And he goes into a very detailed discussion about why he  
23 doesn't believe that anybody can reach the conclusions that  
24 you've reached from reading the same type of literature,  
25 correct?

1 A. Many of Dr. Egilman's opinions are wrong. They're  
2 demonstrably wrong. Let's go through them.

3 Q. I just asked you one simple question. Does he disagree  
4 with you?

5 A. And I gave you a simple answer. Much of what he says is  
6 wrong, and I can show you it's wrong. Let's go through it.

7 Q. And when you go to trial, the 15 times that you've gone  
8 to trial and you've taken the stand and you've given the  
9 presentation that you did on direct, somebody like me comes in  
10 and cross examines you and gives the position of other people  
11 who disagree with yours, correct? It's a debate in the legal  
12 context?

13 A. To the best of my recollection I've only been asked about  
14 Dr. Egilman's opinion piece once on the stand, and I never  
15 heard about it again. Because you can show that Dr. Egilman's  
16 points are poorly informed and wrong.

17 Q. Now you're familiar with a paper entitled, *Asbestos*  
18 *Exposure Causes Mesothelioma But Not This Asbestos Exposure*,  
19 an Amicus Brief to the Michigan Supreme Court by Laura Welch?

20 A. I am familiar with that, yes.

21 Q. And you recognize that she was joined by 51 other  
22 signatories on her paper, correct?

23 A. I am aware that a number of other people signed that  
24 paper.

25 Q. And among those signatories were people that are

1 epidemiologists just like yourself, correct?

2 A. Yes.

3 Q. Some of them are Ph.D epidemiologists unlike yourself,  
4 correct?

5 A. We'd have to go through them. I think some of them have  
6 Ph.Ds in epidemiology.

7 Q. And their very purpose of this paper is to say that there  
8 is a debate whether exposure to brakes can cause mesothelioma;  
9 isn't that true?

10 A. Well, I think that's one of the purposes of the paper.  
11 There is a debate. And when you look at the scientific  
12 evidence, there is not support for there being risk --  
13 increased risk of mesothelioma related to brakes.

14 Q. I'll only make one point with this paper.

15 They say in their abstract, this article outlines the  
16 evidence supporting the conclusion that asbestos from brakes  
17 can and does cause mesothelioma and describes the defendant's  
18 attempts to fabricate doubt about this conclusion. That's  
19 what they wrote, correct?

20 A. Well, you've read it correctly. I strongly disagree with  
21 the assertion that presenting contrary evidence is an attempt  
22 to fabricate doubt. Scientific inquiry is about data and  
23 evidence and scientific methods.

24 If the people who disagree with you are characterized as  
25 fabricating doubt, I think that is contrary to the practice of

1 science and the goals of science to not entertain that they  
2 actually have data and evidence that is on their side.

3 I would also point out that Dr. Welch's paper failed to  
4 consider most of the positive evidence. She doesn't cite the  
5 papers I cited. It's not clear that she has read them or  
6 given them any fair consideration.

7 I think it would be fair to say that her paper is a  
8 biased representation that selectively finds only the positive  
9 evidence and ignores all contrary evidence. Methods like that  
10 are not reliable scientific methods, and you cannot draw  
11 reliable inferences when you are unwilling to consider the  
12 data that doesn't go your way.

13 Q. And yet 52 of her colleagues, 51 of her colleagues, many  
14 of them Ph.Ds in epidemiology, agree with the statement that  
15 there is evidence to support the conclusion that asbestos from  
16 brakes can and does cause mesothelioma, correct?

17 A. It's difficult to understand how those people could have  
18 signed that without having read all of the evidence carefully.

19 Q. Now, you did show that there is some recent evidence that  
20 supports that proposition which was the analysis of the  
21 Massachusetts Cancer Registry, where they found that there was  
22 in fact a risk of 2.1, with a 95 percent confidence interval  
23 of 1.1 to 4. That would be a significantly increased --  
24 statistically significant increased risk of mesothelioma from  
25 that occupation, correct?

1 A. As I covered in my earlier slides, yes.

2 Q. Now I wanted very briefly -- you put this slide up where  
3 you did a lung burden analysis for all the various trades to  
4 see where their amphibole asbestos -- what the counts were,  
5 correct?

6 A. That doesn't characterize that accurately, but I've  
7 described this slide previously.

8 Q. And you talk about amphibole fibers. You were aware that  
9 chrysotile asbestos, because of its characteristics, tends to  
10 migrate to the pleura where mesotheliomas occur, correct?

11 A. I can't say that I'm an expert on the migration of  
12 chrysotile versus amphiboles through the lungs.

13 Q. Are you an expert on how easy it is to detect chrysotile  
14 in lung tissue?

15 A. I am not an expert in lung burden analysis.

16 Q. Okay. So your analysis here doesn't include what affect  
17 the exposure to chrysotile would have on these populations,  
18 correct?

19 A. Oh, of course we looked at that.

20 Q. Well, by lung fiber burden analysis?

21 A. By lung fiber burden analysis. Yes of course we looked  
22 at that. There was no significant association between the  
23 lung fiber -- the lung chrysotile fiber content, and the  
24 relative risk of mesothelioma. We looked at it.

25 Q. Where is that chart?

1 A. It's not in there, but we did a multivariate regression  
2 that put in both the amphibole fibers and the chrysotile  
3 fibers. And once you adjust for the amphiboles, chrysotiles  
4 have no significant effect.

5 Q. You would agree with me that there are people in this  
6 chart, specifically shipyard workers, plumbers and  
7 pipefitters, boilermakers and machinists that all have  
8 exposure to gaskets?

9 A. I believe a number of these occupations would come into  
10 contact with gaskets, yes.

11 MR. GEORGE: Your Honor, I have two issues that I  
12 wanted to cover just briefly that deal with his report. Since  
13 his report is in evidence on the *Daubert*, I think this are  
14 two --

15 THE COURT: Go ahead.

16 MR. GEORGE: Okay.

17 Q. In your paper, in your report, you talked about  
18 Balangero, Italy. You say that a series of studies that  
19 reported on the mortality experience of miners in Balangero  
20 mine near Turin, Italy. They started in 1960, ceased in 1990.  
21 They had a work force of 30 -- 300 to 350 men.

22 One of the importance of the exposures of those  
23 individuals was represented in a paper by Mirabelli and others  
24 entitled, *Excess of Mesotheliomas After Exposure to Chrysotile*  
25 *in Balangero, Italy*. Are you familiar with that paper?

1 A. Yes.

2 Q. And what they found is, this is a chrysotile comes from a  
3 mine in Italy that's considered to be free of tremolite. In a  
4 cohort study of miners and millers, only two pleural cancers  
5 were reported. A finding considered to indicate chrysotile  
6 has a low potency of inducing mesothelioma.

7 However, they then did a follow-up which ended in 1987  
8 where they didn't look at the workers -- white collar workers  
9 or the subcontractors, these authors did, and what they found  
10 is four new cases of pleural mesothelioma among the blue  
11 collar workers in the mine, in addition to two that were  
12 reported in the previous study. Six mesotheliomas compared to  
13 the 1.5 expected.

14 The study also identified three mesothelioma cases among  
15 white collar employees at the mine, five in workers in the  
16 mine hired by subcontracting firms. And three among workers  
17 processing Balangero chrysotile outside the mine.

18 Then they found 10 more cases due to non-occupational  
19 exposure -- where exposure to reused mine tailings were  
20 identified.

21 So they found a total of 27 individuals exposed to this  
22 type of chrysotile who developed mesothelioma, correct?

23 A. Yes. And what they didn't say is that other  
24 investigators who have looked at the ore and found that the  
25 tailings were 10 percent tremolite. So when they say that

1 it's tremolite free, that conflicts with other investigators  
2 who have reported the tailings had very high concentrations of  
3 tremolite.

4 Q. And we're going to get to that.

5 Conclusions. The cluster of 14 mesothelioma cases among  
6 workers who were active in the mine, and 13 among people  
7 exposed to Balangero chrysotile, provides further evidence  
8 that tremolite-free chrysotile is carcinogenic. That was  
9 their conclusion, correct?

10 A. That is what they said, but it is difficult to reconcile  
11 that with the evidence that the tailings were very high in  
12 tremolite.

13 Q. Well they say the authors who studied this mine say that  
14 the chrysotile from this mine is tremolite free, and contains  
15 trace amounts of a substance called balangeroite, a  
16 non-asbestos fibrous mineral similar in shape to amphiboles.  
17 That's what they reported, correct?

18 A. These authors say tremolite free, other authors say  
19 10 percent tremolite in the tailings.

20 Q. They say that the asbestos and the mine tailings --

21 A. Sir, I hadn't finished, if I might.

22 Q. Well you made this point twice, and I'm going to get to  
23 the study --

24 THE COURT: Let him finish.

25 THE WITNESS: I was speaking, sir.

1           You've raised another very important point which is  
2 the balangeroite. That is a fibrous mineral that is similar  
3 to amphiboles. In early reports it was felt to have toxicity  
4 similar to crocidolite. It is a contaminant in the chrysotile  
5 concentration ranges between .5 and 2 percent. Later reports  
6 suggest that it may not be as toxic as crocidolite.

7           So the issue at Balangero is the following, there's  
8 substantial evidence the tailings were contaminated with  
9 tremolite, and there is the existence of another fibrous  
10 mineral that is worrisome with respect to its toxicity that  
11 may relate to mesothelioma.

12 Q. Now when they looked at the tailings, which were crushed  
13 serpentine rocks left over after fiber extraction, they only  
14 found up to 1 percent chrysotile fibers by weight, correct?  
15 That's what those authors reported.

16 A. And they didn't comment on the tremolite content of  
17 tailings.

18 Q. Well they did comment by saying it was tremolite free?

19 A. They said the ore was tremolite free, they didn't mention  
20 the tailings. The tailings, in some authors' observations  
21 were 10 percent tremolite.

22 Q. They said the hypotheses had been advanced, that  
23 chrysotile itself would not induce malignant mesotheliomas and  
24 that there are occurrences in Quebec miners and millers could  
25 be due contamination by fibrous tremolite. The occurrence of

1 mesothelioma in individuals with exposure to Balangero  
2 chrysotile, is important, because no tremolite has been  
3 detected in it. That's what those authors reported, correct?

4 A. Yes, sir. And I have reported -- or I've pointed out now  
5 a number of times now, other authors say the tailings had  
6 10 percent tremolite.

7 Q. They go on to say that balangeroite has never been tested  
8 for carcinogenicity in long term animal experiments.  
9 Therefore in light of current knowledge, it cannot be  
10 considered a carcinogen, nor can it be implied to cause  
11 mesotheliomas instead of chrysotile. That's what their  
12 authors said, correct?

13 A. Well, I think they had slightly different conclusions in  
14 a different paper. I would agree that the carcinogenicity of  
15 balangeroite has not been characterized. And it is not clear  
16 whether it does or does not cause mesothelioma.

17 Q. I apologize for turning back. I'm trying to grab  
18 something.

19 Would you agree with me that you did not cite this paper  
20 in your report?

21 A. Could you go back to the title of it, please?

22 Would you give me a copy of it then, please.

23 MR. GEORGE: Sorry. May I approach, Your Honor?

24 THE COURT: Yes.

25 MR. GEORGE: Now that I'm almost there. (Handing

1 witness paper.)

2 THE WITNESS: Thank you. All right. This paper, if  
3 you go back to the abstract, makes it clear.

4 This basically reports the results could we --

5 BY MR. GEORGE:

6 Q. My question is simple. In your report, did you cite this  
7 paper? I have you citing Rubino, Piolatto, Silvestri, Pira,  
8 Rubino. I do not see a cite for Mirabelli; is that  
9 correct?

10 A. Mr. Smith George, if you ask me a question about a paper  
11 and then take it down and then move on before I answer it,  
12 sir, I can't answer it sir. I would like to answer.

13 Q. My only pending question is, is it in your report?  
14 That's the pending question.

15 MR. SCHACHTER: To save time, Your Honor, may I show  
16 him the bibliography to the report that contains the citation  
17 to this paper?

18 MR. GEORGE: I'm not talking about the bibliography.  
19 I'm talking about the discussion of balangeroite in Italy  
20 that's in your report. Is that contained in your discussion  
21 of Italy's balangeroite?

22 A. It's cited in my bibliography because it is discussed in  
23 my report. Do you want to find it?

24 Q. It's certainly not discussed in the part of your report  
25 that talks about Balangero, Italy, correct?

1 A. Let's find it.

2 Q. We'll save that.

3 A. Reference 156. If I might try to answer your question  
4 before you move on.

5 This is about the mesothelioma registry, okay. If you  
6 could go back and show the methods and make it a little  
7 larger. It's not about -- it's not limited to the workers in  
8 the mine. It's -- it's about a registry study where they are  
9 simply tallying up cases. They don't have any measures of  
10 association in this paper. All they're saying is, we have  
11 found mesotheliomas in the region of this mine.

12 Okay. You don't have a measure of association. You  
13 don't have a test of statistical significance. What you have  
14 is a tabulation of cases, some of which came from the miners.  
15 Some of which who came from the people who worked with the  
16 tailings. Some of which who worked in the region in other  
17 industries.

18 Q. Okay. Now with regard to balangeroite, you're aware that  
19 Turci and others have investigated the ability of this trace  
20 contaminant in the Balangero chrysotile to cause mesothelioma.  
21 You're seen this article before, correct?

22 A. I'm aware of this article and its predecessor to it that  
23 complained the in vitro cited toxicity of balangeroite was  
24 similar to crocidolite.

25 Q. What these authors found at a later point in time, is

1 that considering the profound differences between the  
2 structure of balangeroite and amphiboles, previous results and  
3 observations on poor ecopersistence of balangeroite and the  
4 present data, we conclude that the balangeroite traces may  
5 contribute to the overall toxicity of the airborne fibers in  
6 balangeroite, but may not compare to tremolite -- be compared  
7 to tremolite, nor considered the sole responsible for the  
8 excess of mesothelioma found in balangeroite.

9 So they're saying, unlike Canada where there's a  
10 plausible explanation that may be the tremolite is  
11 contributing to the mesothelioma deaths in the Canadian  
12 chrysotile workers. In the Italian chrysotile workers, we  
13 can't say that Balangero (sic.) is solely responsible for the  
14 excess mesotheliomas, correct? That's what they're saying?

15 A. I think that's what they're saying. It says, we don't  
16 think it's solely responsible. But I think that what is in  
17 there is an admission that it may be responsible in part and  
18 they don't know.

19 Q. And what they say is, balangeroite has a crystal  
20 structure different from amphiboles, exhibits an  
21 ecopersistence and a durability in body fluids of the same  
22 order of magnitude of chrysotile, and was supposed to be never  
23 detected in exposed workers. Under such circumstances, it may  
24 slightly contribute to the overall toxicity, but cannot be  
25 considered responsible for the excess of mesothelioma found in

1 Balangero in past and more recent studies.

2 That's what they found, correct?

3 A. That is what they said. But if you can please just hold  
4 for a minute before you move on. And I believe what they're  
5 saying is, we don't think you can attribute all of the excess  
6 of mesotheliomas to balangeroite. It might be in part due to  
7 balangeroite, it might be in part due to the chrysotile.

8 I think a fairer answer would be, the carcinogenicity of  
9 balangeroite has not been characterized fully, we simply don't  
10 know.

11 Q. This -- you said that there was no statistical  
12 association between the exposure of balangeroite and  
13 mesothelioma in the Mirabelli paper, correct?

14 A. No. That is not what I said.

15 Q. You -- you're familiar with Piolatto?

16 A. Piolatto.

17 Q. Piolatto. That was an update that they did on the same  
18 miners in 1990, correct, cited in your paper?

19 A. I'm actually looking for it. You'll have to forgive me.  
20 It takes me a moment. Anyhow, I have read the paper.

21 Q. And you're aware that they examined several samples of  
22 chrysotile from the mine, and ruled out the presence of  
23 contamination with fibrous amphiboles at detectable  
24 concentrations. In other words, they didn't find any  
25 tremolite, correct?

1 A. Well, sir, you're belaboring a point about the ore, where  
2 I keep talking about the tailings. Now that's an important  
3 distinction, because -- and I'm not a miner. I don't claim to  
4 be an expert in mining. But the point is, when you mine,  
5 there's a lot of stuff that has no economic value. That's  
6 called tailings, and you throw it away. So while the ore may  
7 not have tremolite in it, the tailings did.

8 If you're a miner, you're mining both. And if you're  
9 exposed to the waste from the mine -- if someone is giving  
10 away the tailings to be used in road construction or for other  
11 uses, you may have exposure to tailings but not the ore.

12 So you keep putting up that the ore doesn't have  
13 tremolite, I keep saying that the tailings appear to.

14 Q. And the sole basis for you to say that the tailings have  
15 tremolite in it is this study by Mickey Gunter, Elena Belluso  
16 and Annibale Mottana entitled, *Amphiboles: Environmental*  
17 *Health Concerns*, 2007 correct?

18 A. Yes.

19 Q. And this is a easily more than a 50-page book chapter,  
20 correct?

21 A. I believe so.

22 Q. And the only reference in the entire chapter that they  
23 have to balangeroite says, "the now closed mine is still  
24 surrounded by over 65 million cubic meters of waste hosting an  
25 estimated 800,000 cubic meters of fibers, most of which are

1 short fiber chrysotile. But there is an estimated 10 percent  
2 tremolite in the tailings."

3 There is no citation to where they got that information  
4 from, is there?

5 A. I do not see a citation.

6 Q. We don't know where this area is, and we don't know where  
7 those tailings came from, do we? They don't tell us. They  
8 just say there's a mound of stuff, 10 percent of which may  
9 have tremolite in it?

10 A. Well it says the mine is surrounded by waste, 65 million  
11 cubic meters that is 10 percent tremolite. I think it is a  
12 reasonable presumption that the waste surrounding the mine  
13 came from the mine.

14 Q. That's a presumption you're making. There is no  
15 objective evidence that those tailings came out of the mine,  
16 or whether they came from some other area and were dumped  
17 there. There is nothing that those authors cite to where we  
18 can find where the location of this is and how they came up  
19 with their estimate of 10 percent, correct?

20 A. I do not know where they got their data regarding the  
21 tremolite in the tailings. They don't say. It does raise a  
22 reasonable concern that there was a lot of tremolite in the  
23 minerals coming out of that mine.

24 MR. GEORGE: This is a good time to break for lunch,  
25 if you would like, Your Honor.

1 THE COURT: I would like to get him off the witness  
2 stand.

3 MR. GEORGE: Okay.

4 Q. One last area that I wanted to talk about really quick is  
5 the Marshville plant in North Carolina.

6 Now the reason why this plant is important is because --  
7 and you're familiar with the Loomis/Dement paper, *Lung Cancer*  
8 *Mortality in Fiber Exposures Among North Carolina Asbestos*  
9 *Textile Workers*, correct?

10 A. Yes, sir.

11 Q. This study provides further evidence that exposure to  
12 chrysotile asbestos in textile manufacturing is associated  
13 with an increased risk of lung cancer, asbestosis, cancer of  
14 the pleura and mesothelioma, correct?

15 A. That's what it says.

16 Q. And what they base it on is the fact that three workers  
17 with deaths coded to pleural cancer had been employed in plant  
18 three. Now they did use amosite in plant three, but it was in  
19 an area where none of those worked, correct?

20 A. I'm not sure why we're even talking about plant three,  
21 but that's what it says.

22 Q. Well, because the only exposure that those three workers  
23 had was to chrysotile asbestos, because they didn't work in  
24 the area where the amosite was, according to the authors?

25 A. I don't believe that that's a fair conclusion. So your

1 comment is that if they didn't work in the insulation areas,  
2 they didn't have exposure to amosite?

3 Q. Well that's what the authors say. The three workers with  
4 deaths coded to pleural cancer, have been employed at plant  
5 three where some processing of amosite is known to have  
6 occurred, but none of them had worked in the insulation areas.

7 A. Well, I think these authors did not conclude that plant  
8 three was a pure chrysotile plant. They admitted that this  
9 was a mixed exposure plant.

10 Q. Right. And they did the processing in a part of the  
11 plant where the three people with mesothelioma didn't work.

12 A. Well, do you want to hand me a copy of the paper?

13 Q. Let's move on to Marshville just so I can get you off the  
14 stand.

15 The remainder, including all four workers whose deaths  
16 were coded to mesothelioma, had worked at plant four, where  
17 there's no record of amphibole asbestos having been used.

18 That's what John Dement wrote, correct?

19 A. That's what they wrote and it is clearly wrong now.

20 Q. Now that may be underreported, because mesothelioma is  
21 believed to have been underreported in early years of the  
22 study, so it's possible that they missed some cases, correct?  
23 That's what they report?

24 A. Well, that's what they said, yes.

25 Q. Now you say that Dr. Dement is wrong, because there's

1 records that exist showing that there was amosite in plant  
2 four which we know is the Marshville plant, correct?

3 A. That's correct.

4 Q. Now, you got documents -- and I assume the documents  
5 actually came through your counsel, correct?

6 A. Yes.

7 Q. And in fact, they asked the Manville trust, which  
8 Johns-Manville brought the plant from UNARCO in 1963, correct?

9 A. I believe so.

10 Q. They asked the Manville trust, do you have any documents  
11 about this Marshville plant. And they provided literally,  
12 3,000 -- almost 4,000 pages of documents about the Marshville  
13 facility, and another 3,000 pages of deposition testimony,  
14 correct?

15 A. I don't actually know what you're talking about. I have  
16 not seen 7,000 pages of documents from that plant.

17 Q. These three affidavits are in your report, correct?

18 MR. SCHACHTER: To speed it up, it's in the  
19 appendix.

20 Do you mind Your Honor?

21 THE COURT: No. Go ahead.

22 THE WITNESS: Yes. The affidavits are attached in  
23 appendix to my report, yes.

24 BY MR. GEORGE:

25 Q. So from your comments I gathered you weren't the one who

1 looked at these 7,000 pages of documents to see if there was  
2 any evidence of amphibole, that was done by your counsel,  
3 correct?

4 A. I did not look through 7,000 pages of documents regarding  
5 the Marshville plant.

6 Q. So your counsel found some documents which they gave to  
7 you. One of which is some answers to interrogatories.  
8 They're also attached to your report. And they talk about the  
9 fact that asbestos textiles were manufactured from chrysotile  
10 asbestos fiber and cotton, twisted into yarn, and then woven  
11 to cloth, tape, tubings, sleeves, and cords, and they were  
12 manufactured at Marshville, correct, according to these  
13 interrogatories?

14 A. Those materials using chrysotile among others, yes.

15 Q. Braided asbestos packings, yarns treated -- braided into  
16 squares, twisted or plain treated with neoprene or other  
17 coatings were made at Marshville, correct?

18 A. Yes. And we know some of the products contained amosite.

19 Q. Those are the only two entries in those UNARCO  
20 interrogatories that mentioned what Marshville produced,  
21 correct?

22 A. I'm not sure what you're referring to in those Marshville  
23 interrogatories. There's quite a bit of evidence about what  
24 Marshville produced.

25 Q. In the UNARCO interrogatories which are a part of your

1 report, the only two entries in interrogatories sworn to by  
2 UNARCO is these products were manufactured at Marshville,  
3 correct?

4 A. I don't even know how to answer that. There are other  
5 documents in my report, such as the deposition testimony of  
6 John Aldridge that make clear that amosite products were also  
7 manufactured at Marshville.

8 Q. And we'll get to Aldridge. I'm taking only about the  
9 UNARCO interrogatories. They list tons of products. The only  
10 ones they said were made specifically at Marshville, were  
11 asbestos textiles manufactured from chrysotile and braided  
12 into asbestos packing, corrects?

13 A. Just a moment. Okay. There are exhibits to the  
14 interrogatories --

15 Q. Yes.

16 A. -- that mention the basic raw materials used in the  
17 company's asbestos products where chrysotile and amosite  
18 asbestos. And so I think the interrogatories with the  
19 appendices establish that both chrysotile and amosite were  
20 used.

21 Q. That's not my question. My question is this, the only  
22 portion of UNARCO's answers to interrogatories where they say  
23 this is what was made at Marshville, was asbestos textiles and  
24 braided packings, correct?

25 A. Sir, I'm not a lawyer, and I don't understand the

1 question. When there is an appendix or an exhibit attached to  
2 a interrogatory, why I should ignore that. You'll have to --  
3 Q. Well let's go further. The cloth, you would agree, is  
4 made out of chrysotile. Because they say so. Description,  
5 woven from asbestos yarn. Yarns are made from long fiber  
6 chrysotile asbestos, through a process where they make  
7 non-twisted strands called rovings, and then they spin them to  
8 produce yarn, and then the yarn is turned into cloth. That's  
9 what they report in their interrogatories, correct?

10 A. That is one line of products from the Marshville plant.

11 Q. Now in the UNARCO textile product book, they talk about  
12 yarn, tape, tubing and cloth. And all of those products,  
13 yarn, tape, tubing and cloth, are all chrysotile-containing  
14 products? Would you agree with me that there's no indication  
15 that the yarn, tape, tubing or cloth contained any amphibole  
16 asbestos?

17 MR. SCHACHTER: Your Honor, if I may. This is  
18 really wasting time. His own expert has admitted that the  
19 Marshville documents demonstrate the use of amphiboles at the  
20 Marshville plant, and that the John Dement study should not  
21 have been published with that statement in it. He's going to  
22 get on the stand and admit that so we're wasting valuable time  
23 here going over something that can't really be seriously  
24 disputed?

25 THE COURT: Let's see if we can wind it up.

1 Is there a question pending?

2 BY MR. GEORGE:

3 Q. I'm just asking, is there any amphiboles in those  
4 products?

5 A. It is difficult for me to answer exactly the way you  
6 structured your question.

7 Q. Now this is not the first time you've seen this catalog  
8 because this is part of your report, correct?

9 A. I know, sir. But there are other documents that provide  
10 additional information that is not in the catalog. And I'm  
11 trying to answer carefully.

12 Q. I'll move on. I'll move on. We did spend four hours  
13 about this in your deposition, correct?

14 A. Now, for example, okay. We know that the Insubestos  
15 felt that was made at Marshville, was woven from amosite.  
16 This is the same felt that meets the military specs that  
17 Captain Wasson was talking about yesterday. It was made in  
18 Marshville. We know that from Section Four of my Marshville  
19 documents. And we know it was made in Marshville from the  
20 testimony of John Aldridge, which is Section Three.

21 So while I don't see it in the answers to interrogatories  
22 or the product catalog, it's quite clear that this is an  
23 amosite textile product that was made at Marshville, made with  
24 amosite, and met Navy specifications for use on naval ships.

25 Q. Your sole basis for that statement is the testimony of

1 John Aldridge, correct?

2 Out of the 7,000 pages of documents that you didn't  
3 review, that your counsel reviewed, the only thing they ever  
4 gave you that showed that Insubestos felt was manufactured in  
5 Marshville, is the testimony of John Aldridge, correct?

6 A. Yes.

7 Q. Okay. Now let's explore this real quick. John Aldridge  
8 was hired in 1954 and he was employed in Bloomington, right?  
9 That's in Indiana. He wasn't employed in Marshville?

10 A. That is correct. He had duties to travel to Marshville  
11 and inspect it periodically, I think, a couple times a year or  
12 more over a period of years.

13 Q. In 1958 or '59 he was given assignment to go to the three  
14 UNARCO plants, Marshville, Tyler, Texas and Bloomington to do  
15 air samples, correct?

16 A. I believe that's correct.

17 Q. And he did it.

18 He was asked, what products are produced at the  
19 Marshville plant at that time?

20 He said, asbestos textiles.

21 Was there more than one type of textile being produced?

22 Oh I'm sure there was.

23 Do you remember?

24 And he shook his head, no.

25 Do you remember?

1 No. He didn't remember what types of products were  
2 manufactured at Marshville, according to this testimony,  
3 correct?

4 A. At page 115 he remembered Insubestos.

5 Q. At this point he doesn't remember, correct? Is that what  
6 the testimony says?

7 A. At this point in response to that question, that was his  
8 answer.

9 Q. Then at the end of the deposition they asked him, are you  
10 familiar with a product line known as insabestos (phonetic).

11 He said, yes.

12 Could you tell me what it is?

13 He said it was a thick asbestos felt.

14 Where was it manufactured.

15 He said, I believe the start of the process was in  
16 Marshville, and I believe the finish of the product was  
17 Bloomington.

18 Now you don't know what the "start of the process means",  
19 do you?

20 A. Well, I believe that Marshville was a textile plant.  
21 They made thread and rovings, and wove things. And Insubestos  
22 was made from an asbestos -- I don't know my terminology for  
23 textiles well -- rovings, I believe, that were on brass wire  
24 and it was made into a felt to the military specifications.

25 Q. Bottom line is, you don't know what it means to "start

1 the process in Marshville", correct?

2 A. I do not know specifically what it means "to start the  
3 process in Marshville".

4 Q. And your counsel didn't provide you with UNARCO's answers  
5 to interrogatories from Utah, did they -- I mean from  
6 Colorado?

7 A. I don't recall them in the way you described them. Could  
8 I see them?

9 Q. Sure. (Handing paper writing to witness.)

10 A. Thank you.

11 Q. These are interrogatories just like the ones you relied  
12 on, correct?

13 A. Well, I haven't had time to read them. They are  
14 responses to interrogatories.

15 Q. If you go to the third -- fourth to the last page, they  
16 actually give us information about what was made at the  
17 various plants.

18 A. Yes.

19 Q. And they tell us -- switch -- that was made in  
20 Marshville, kind of the same thing that was made in Davidson,  
21 which was cloths, tapes, tubings, yarns, et cetera. The  
22 Insubestos felt on the other hand was made in Bloomington.

23 They said, these products in the plant in Bloomington,  
24 unibestos pipe insulation, unibestos insulating blocks,  
25 Wovenstone, Insutape, Insutube, Insubestos,

1 were all made in Bloomington. That makes sense because all  
2 those products have amosite in them, correct?

3 A. Well, that makes sense, but it also makes sense that it  
4 was done in Marshville, because we have documents that I've  
5 put in my appendix that show certain looms were weaving  
6 amosite. And that amosite products were being shipped in  
7 tonnage quantities from Marshville.

8 Q. First of all, out of that 7,000 pages of documents, you  
9 haven't seen a single purchase order going to Marshville from  
10 a company that sold them amosite fiber, correct?

11 A. I have not seen such a document.

12 Q. And the document that you're referring to about proving  
13 that amosite was used, is this document? First of all, you  
14 have no idea what that document is, do you?

15 A. Well, let's -- let me at least get to the full document  
16 rather than just --

17 Q. That is the whole document.

18 A. Well, let me at least open my copy. Can I see the Bates  
19 number at the bottom?

20 Q. 002887. This was the document that you were referring  
21 to, correct?

22 A. Yeah. I'm on the same page, yeah.

23 Q. That was the document you are referring to, correct?

24 A. Yes.

25 Q. Now all we know is it's loom something. Because we can't

1 even read what the loom number is. We know they did a bunch  
2 of styles of stuff, but we have no idea what those styles are,  
3 correct?

4 A. Some of those you can actually correlate back to the  
5 product manual.

6 Q. Have you done that?

7 A. Some of them I did try to cross reference them back, yes.  
8 And you can clearly --

9 Q. They're all chrysotile --

10 A. You can clearly identify Wovenstone cloth. And you can  
11 see the headings are blocked out, but it says through 40  
12 inches and something else says 50 inches. So you have the  
13 dimensions. You can see the max width is 60 inches. The  
14 actual min width is 30 inches. So they're weaving various  
15 textile products on a loom that can handle 30 inches to  
16 60 inches, and they have specifications for the different  
17 products.

18 Q. What this document doesn't tell us, how much did they  
19 manufacture; when did they manufacture it; where did they  
20 manufacture it; what was the result of the manufacturing; and  
21 what was contained within the woven stone cloth? That  
22 document doesn't answer any of those questions, correct?

23 A. This document alone does not answer the questions.

24 MR. GEORGE: I'm almost done.

25 Q. I'm skipping through. The last point I want to raise is,

1 you are aware that Dr. Dement actually had dust measurements  
2 from the Marshville plant, correct?

3 A. Which paper is this?

4 Q. This is, increased lung cancer mortality among chrysotile  
5 asbestos textile workers is more strongly associated with  
6 exposure to long thin fibres.

7 A. I was just trying to see which journal was it published  
8 in, sir.

9 Q. It's from the Occupational Environmental Medicine, 2012.

10 A. May I see a copy?

11 MR. GEORGE: Your Honor, may I approach?

12 THE COURT: Yes, sir.

13 THE WITNESS: Thank you.

14 BY MR. GEORGE:

15 Q. You are aware of the document, are you not?

16 A. I think I have seen this in the past, yes.

17 Q. And what this document -- what they did in making their  
18 assumption that most of the exposure if not all of it was to  
19 chrysotile, is they had 160 historical dust samples that were  
20 captured on membrane filters that were collected in surveys of  
21 the study of the plants, 1964 through 1971, correct?

22 A. Well, that's the first sentence. If you read the next  
23 sentence if you would, please. It says the TEM fiber counting  
24 protocol was based on the ISO direct transfer method. And  
25 procedures for combining the data by plant and operation, and

1 deriving size specific exposure estimates followed the  
2 procedure described by Dement, et al.

3 To the extent I'm aware of it, they could not  
4 differentiate between amphiboles and chrysotile with those  
5 methods.

6 Q. Well, don't they say on page 567 that contamination with  
7 amphibole fibers is also unlikely to confound the results.  
8 Fibers were identified by morphology. And morphology means  
9 these physical characteristics of the fiber, length, width, et  
10 cetera, correct?

11 A. Well, what they've done now is they've gone to an  
12 electron diffraction technique. So my previous comment was  
13 correct, the TEM doesn't tell you the fiber type. Now they  
14 have gone to electron diffraction, and they have counted  
15 38,940 fibers, and they have found amphiboles, but it's a  
16 small proportion --

17 Q. Sixteen --

18 A. What they're not telling, at least as far as I am aware,  
19 is whether these fibers are representative of all 160 historic  
20 dust samples. And what they're not telling is whether the 160  
21 historic dust samples are representative of the range of  
22 exposures in the plant.

23 So while they did find amphiboles, what you cannot say  
24 from what they've written here, is whether that is a fair  
25 characterization of the use of amphiboles in that plant in

1 different areas at different times.

2 Q. So they had 38,940 fibers. They looked at all of them  
3 under selected area diffraction which tells us what's the  
4 chemical composition of that fiber so we know whether it's  
5 chrysotile or whether it's an amphibole, correct? That's what  
6 the process is.

7 A. I believe that method allows you to differentiate  
8 amphiboles from chrysotile.

9 Q. And out of the 38,940 fibers, they found 16, 0.04 percent  
10 of them were amphiboles. And 14 of the 16 they could  
11 positively identify as tremolite, actinolite and not amosite,  
12 correct?

13 A. That's what they said. My previous comment still stands.  
14 There's no characterization in this paper that this result is  
15 representative in any way of the areas where we know  
16 amphiboles were being used, and the looms that we believe were  
17 weaving amphiboles.

18 Q. Your assumption that amphiboles were being used is not  
19 supported by the documents that say, that all of the insatape  
20 products and the insubestos were manufactured in Bloomington,  
21 correct?

22 If that's true, then your assumption that there were  
23 amphiboles that were made at Marshville is incorrect?

24 A. Sir, to the extent I'm aware of it, Mr. Aldridge  
25 testified to the manufacture of an amosite containing product

1 in Bloomington. Okay.

2 In addition, if you go back to the product catalog, it is  
3 clear that UNARCO was advertising woven products or ropes  
4 could be made with acid resistance. And acid resistance is,  
5 as far as I understand, is a particular characteristic of  
6 crocidolite asbestos. That's why it was chosen, it's an  
7 expensive product. This is clearly advertising that they  
8 could weave and make products for acid resistant applications,  
9 and that their textile plant was Marshville, North Carolina.

10 Q. But they don't say anywhere in that catalog that the  
11 products that we're making for acid resistance come out of  
12 Marshville. They don't say that. They just say, we can do  
13 it. And we know from their interrogatory responses, that any  
14 products that contained amphibole, were manufactured in  
15 Bloomington, correct?

16 A. I don't know that. What I know is that their textiles  
17 came out of Marshville. That's what their catalog says. And  
18 that some of their textiles were made with acid resistant  
19 asbestos.

20 Q. What you didn't do, and what your counsel didn't do is,  
21 you know there's UNARCO trust, correct? They would have all  
22 the documents from UNR. Neither one of you went to the trust  
23 to say, hey, what documents do you have from Marshville? We  
24 want to see if they have amphiboles there. You didn't do  
25 that, correct?

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1 A. I do not have access to the UNR trust, as far as I'm  
2 aware.

3 Q. And your counsel didn't present you with any documents  
4 that came out of the UNR trust that were UNARCO documents from  
5 the time period before 1963 when UNARCO owned that plant,  
6 correct?

7 A. I have not seen documents from the UNR trust.

8 MR. GEORGE: I have nothing further, Your Honor.  
9 Thank you.

10 MR. GUY: Your Honor, I hate to do it, but I have  
11 very short --

12 CROSS EXAMINATION

13 BY MR. GUY:

14 Q. Mr. Garabrant, my name is Jonathan Guy. I represent the  
15 FCR in this case, Joseph Grier, III.

16 A. Good morning -- good afternoon.

17 Q. Good afternoon. Anyway, sorry. I'll be very brief.

18 Your testimony today on direct related largely to your  
19 2004 article on meta-analysis, correct?

20 A. No. My testimony today relies on the meta-analysis I  
21 conducted as part of my work on this case. It relied on  
22 similar methods to the 2004 publication, but it included a  
23 substantial body of additional scientific literature.

24 Q. Was that article published so it was available to the  
25 public to review?

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1 A. The Goodman article; yes.

2 Q. Would it have been available to asbestos defendants such  
3 as Garlock, correct?

4 A. I'm not sure I understand. The Goodman article is in  
5 Annals of Occupational Hygiene. Anyone who can get to a  
6 library, a medical library, can get a copy of it, or anyone  
7 can, I think, purchase it from the journal.

8 Q. Anyone including an asbestos defendant like Garlock,  
9 correct?

10 A. As far as I'm aware, anyone can purchase it, including  
11 Garlock.

12 Q. And in your report, sir, you relied upon earlier  
13 articles, correct, going back to McDonald in 1980?

14 A. In my report I replied -- I relied on every article I  
15 could find, up through the date I wrote the report. And as we  
16 have seen today, I have now added the Roelofs article which is  
17 a few weeks old.

18 Q. I just put that on the bottom.

19 Were those all published in such a way that they were  
20 accessible by the public, each of those articles?

21 A. I believe they are.

22 Q. And they would have been available to asbestos  
23 defendants, correct?

24 A. As far as I'm aware, yes.

25 Q. Asbestos defendants such as Garlock, correct?

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1 A. As far as I'm aware, they're all publicly available to  
2 anyone who inquires and pays whatever the fee is to get a  
3 copy.

4 Q. And you testified at trial for various asbestos  
5 defendants, correct?

6 A. I have testified at trial, principally in the area of  
7 friction product defendants.

8 MR. GUY: No further questions, Your Honor.

9 THE COURT: Anything else, Mr. Schachter?

10 MR. SCHACHTER: Thank you, Your Honor. I just want  
11 to clear up a couple of points.

12 THE COURT: All right.

13 REDIRECT EXAMINATION

14 BY MR. SCHACHTER:

15 Q. Sir, you were shown some dust samples, or some discussion  
16 of dust samples. If indeed as Dr. Dement explained, those  
17 dust samples were taken in the 1960s when another company, a  
18 brake manufacturer owned the plant, Raybestos, would those  
19 dust samples be relevant at all to what was occurring when  
20 UNARCO owned the plant?

21 A. It would be difficult to say whether they had any  
22 relationship at all.

23 Q. And secondly, the documents you've reviewed, are the same  
24 documents that we presented to the expert witness hired by  
25 Mr. Smith George's firm. And I want to show what he talked

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1 about, what he said about those and see if your opinions  
2 differ. Just one moment.

3 MR. GEORGE: I object to using deposition testimony  
4 that he hadn't seen, the witness isn't here to cross examine.

5 MR. SCHACHTER: We just spent 45 minutes of precious  
6 time debating something that even their guy --

7 THE COURT: Go ahead. Put it up and we'll go  
8 through it.

9 MR. SCHACHTER: Apologize, Your Honor.

10 Q. Sir, we took Dr. Brodtkin's testimony from Mr. Smith  
11 George firm, and we asked him if he had reviewed the  
12 Marshville documents. And he said, yes, I read them. I  
13 asked, what were your conclusions. He said, well, I think  
14 there's evidence as we talked about in South Carolina cohorts,  
15 that at times at various plants, there were materials other  
16 than chrysotile, namely in the Marshville plant, amosite was  
17 used for material, I believe insafelt (phonetic). So there  
18 was some mixed fiber use at the Marshville plant which would  
19 have been plant four.

20 Then I asked him about this article. Had you been a peer  
21 reviewer, would you have permitted a study to be published had  
22 you known about these documents saying that only chrysotile  
23 was used at the Marshville plant. He said, well, I would have  
24 been aware of that -- I would have asked them to add that  
25 information.

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1 So I asked him, so the Marshville -- anything about the  
2 Marshville plant in your opinion cannot be taken as indicating  
3 that that was a plant where only chrysotile was used, given  
4 what we now know? And he agreed that he can't state that it's  
5 only a chrysotile plant. He would have to say like the other  
6 plant three, it's a chrysotile dominant plant, but that at  
7 times amosite was used.

8 Are your conclusions any different than the expert that  
9 they hired on this issue?

10 A. Well --

11 Q. On whether amosite was used in Marshville?

12 A. Yeah. Mr. Schachter, my conclusion is that amosite was  
13 used at Marshville. That's quite clear. We know they were  
14 shipping amosite products, they were making amosite products,  
15 they have looms weaving amosite products. Amosite was used in  
16 that plant.

17 MR. SCHACHTER: Thank you. I'll pass the witness,  
18 Your Honor.

19 THE COURT: Thank you. You can step down. Thank  
20 you, Dr. Garabrant.

21 Let's take a break and come back at 2:15.

22 (Lunch recess at 1:08 p.m.)

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1 UNITED STATES DISTRICT COURT  
2 WESTERN DISTRICT OF NORTH CAROLINA  
3 CERTIFICATE OF REPORTER

4 I, Laura Andersen, Official Court Reporter, certify  
5 that the foregoing transcript is a true and correct transcript  
6 of the proceedings taken and transcribed by me.

7 Dated this the 23rd day of July, 2013.

8 s/Laura Andersen  
9 Laura Andersen, RMR  
10 Official Court Reporter  
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